

FIG. 1A

00000001.051601

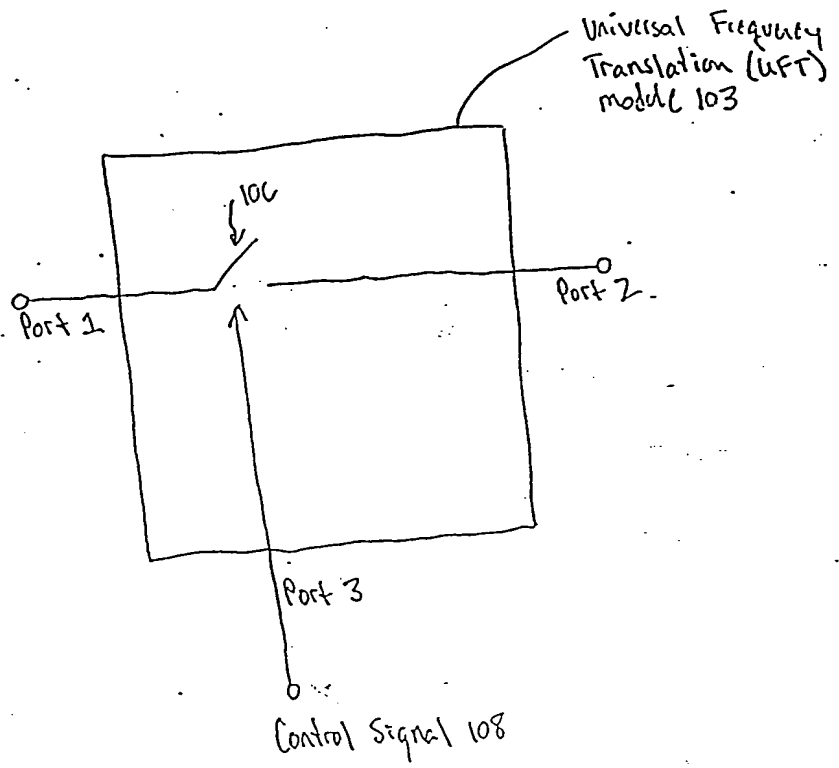


FIG. 1B

09855851.051601

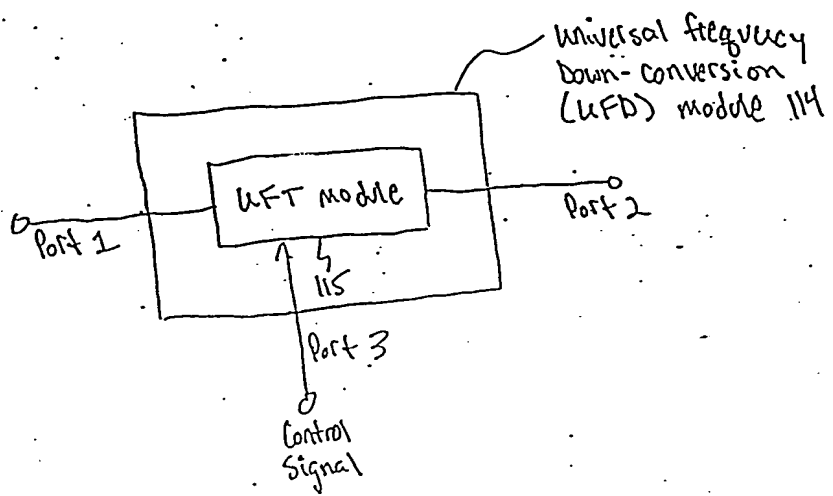


FIG. 1C

09855854.051601

09855851.051601

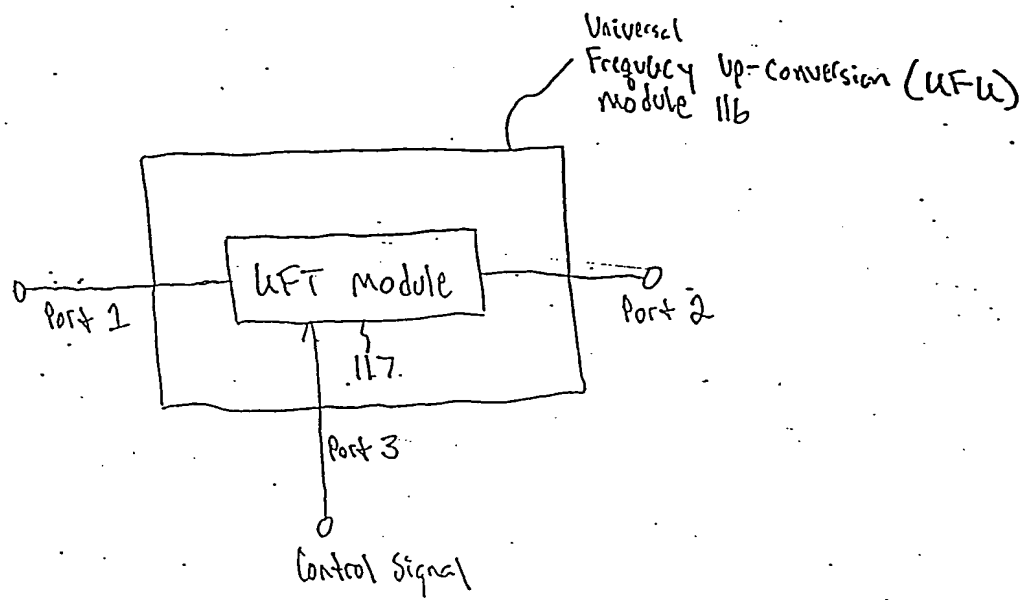


FIG. 1D

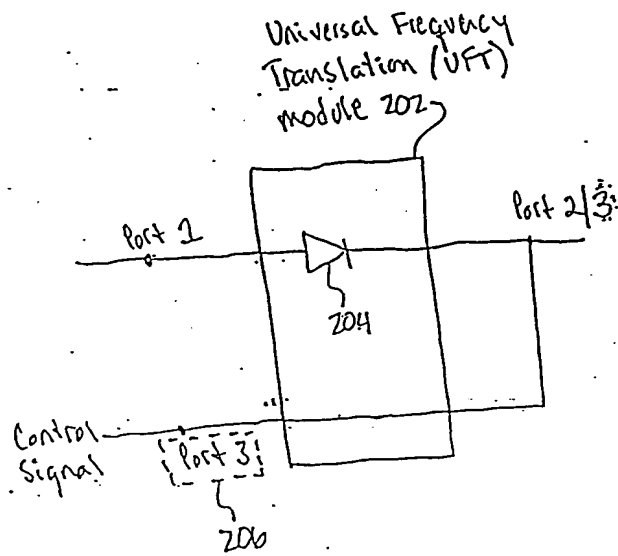


FIG. 2

1

3

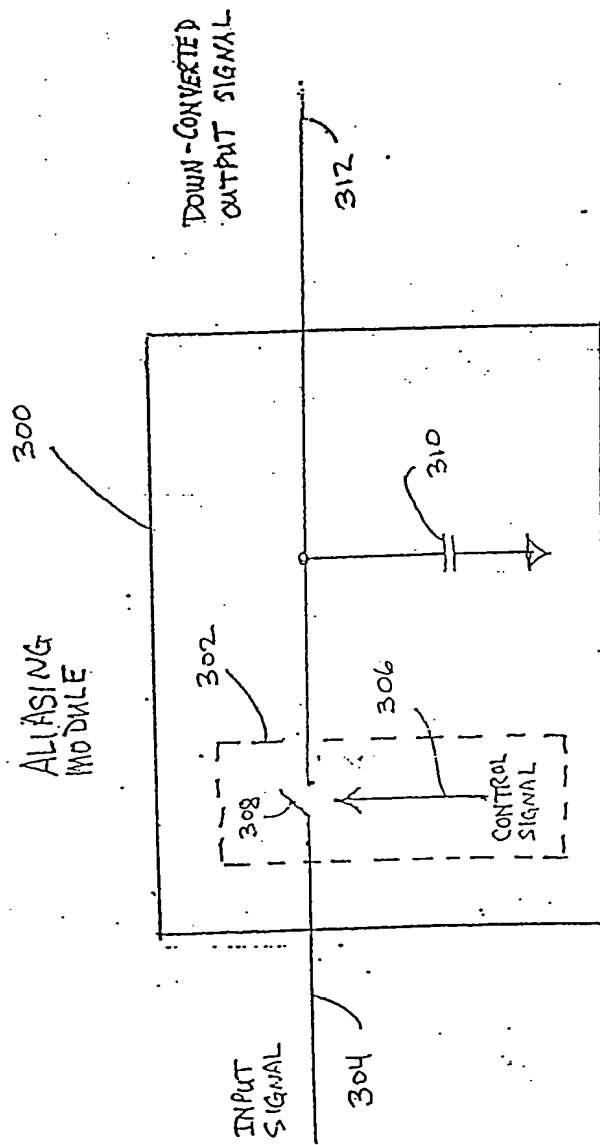


FIG. 3A

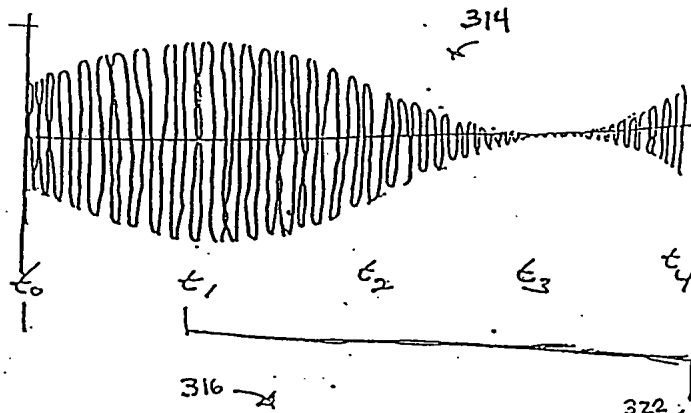


FIG. 3B

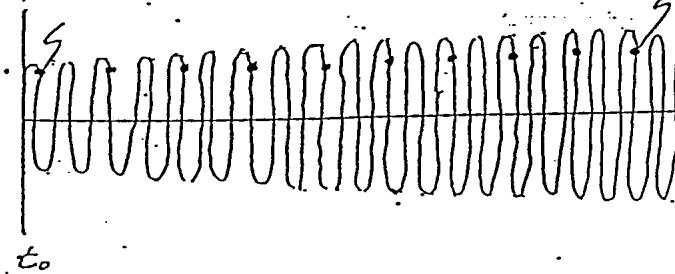


FIG. 3C

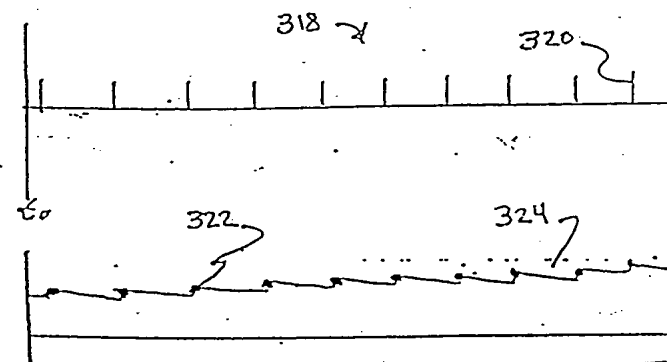


FIG. 3D

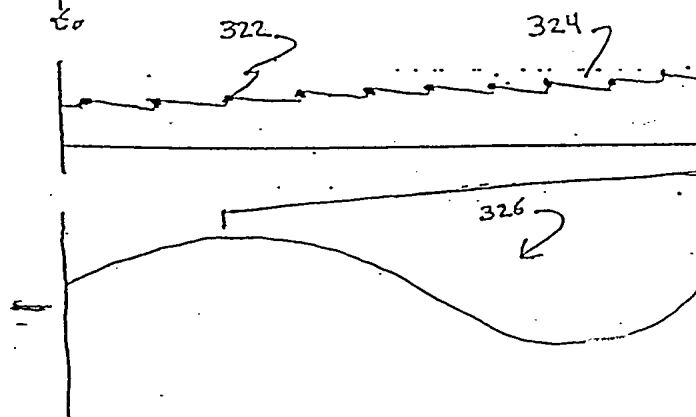


FIG. 3E



FIG. 3F

09855851.051601

W

ALIASING
MODULE

300

DOWN-CONVERTED
OUTPUT SIGNAL

312

INPUT
SIGNAL

304

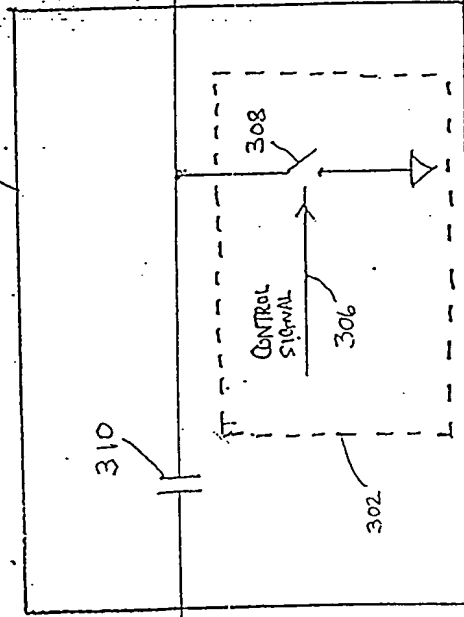


FIG. 3G

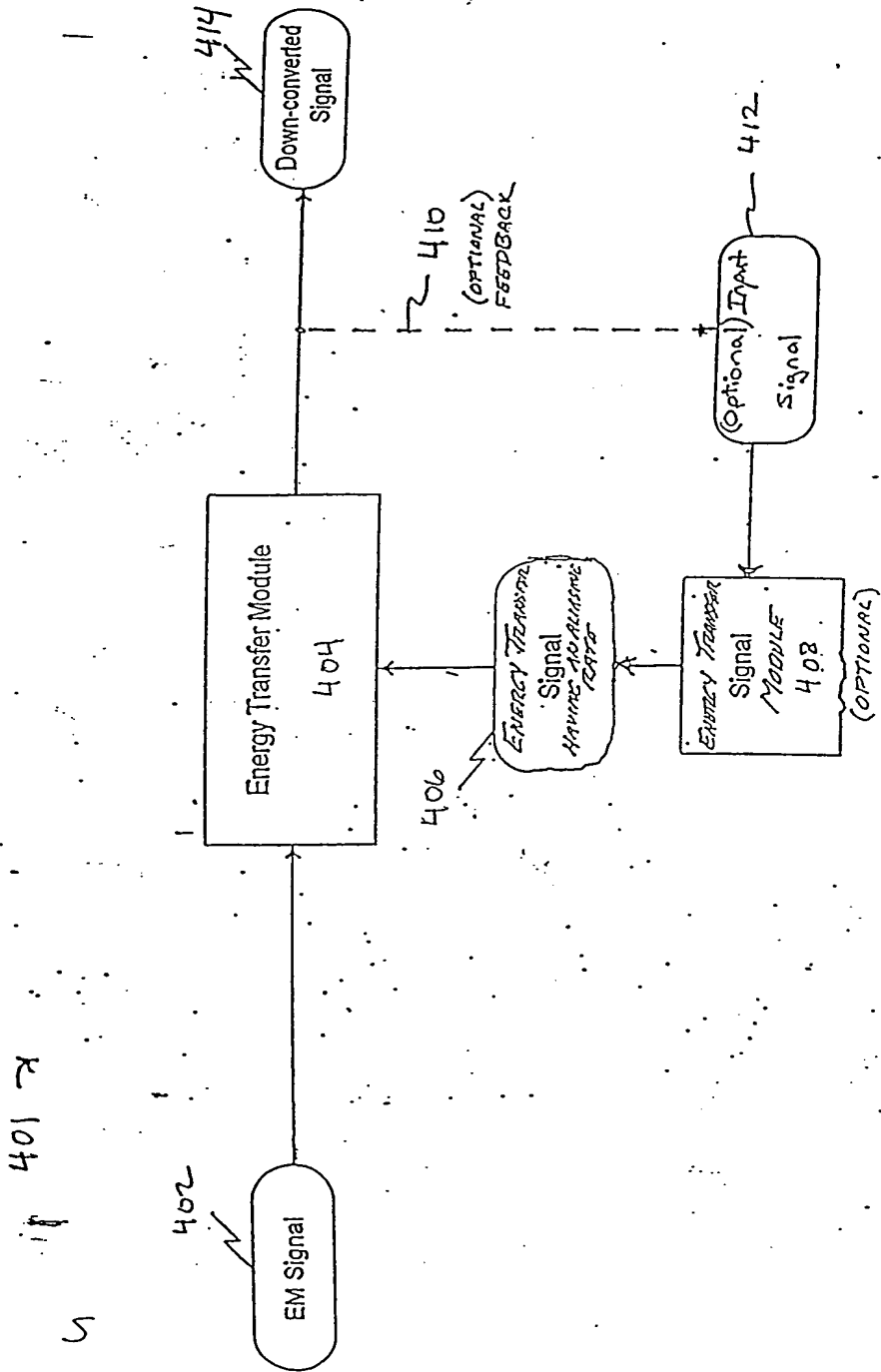


FIG. 4

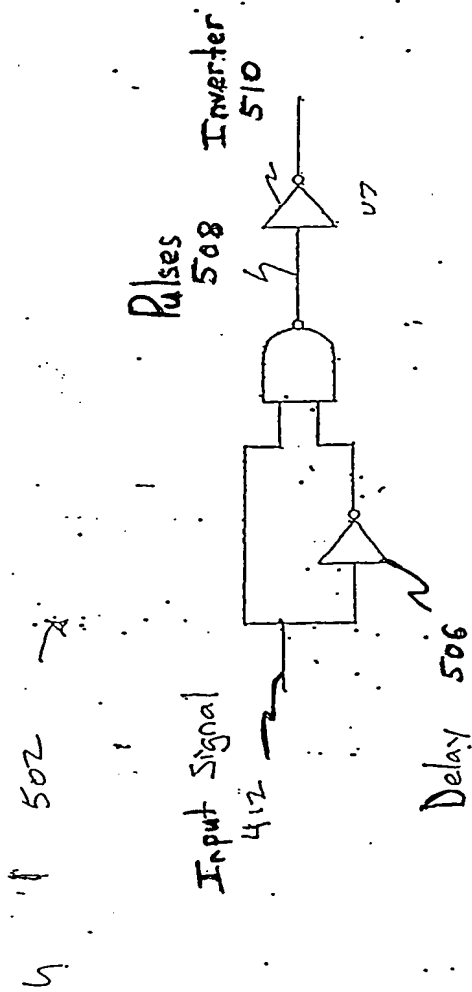


FIG. 5

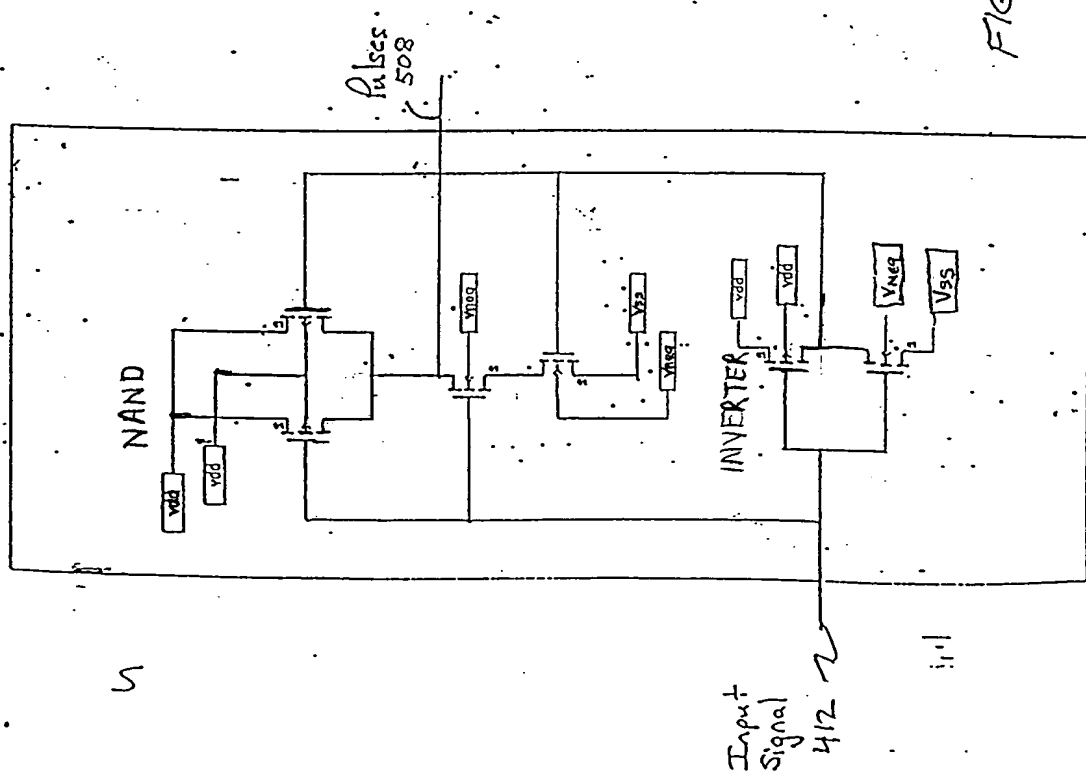


FIG. 6A

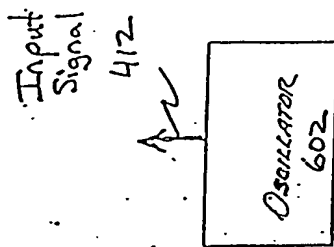


FIG. 6B

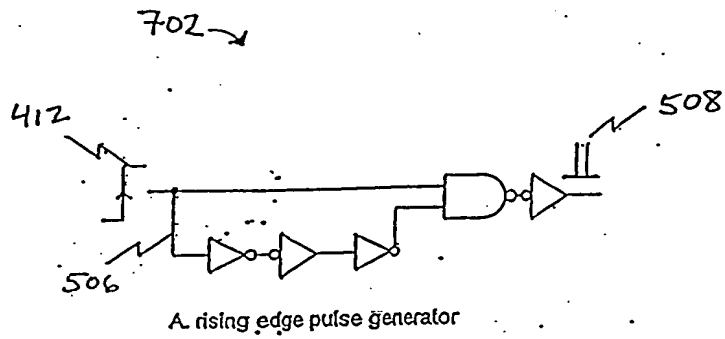


FIG. 7A

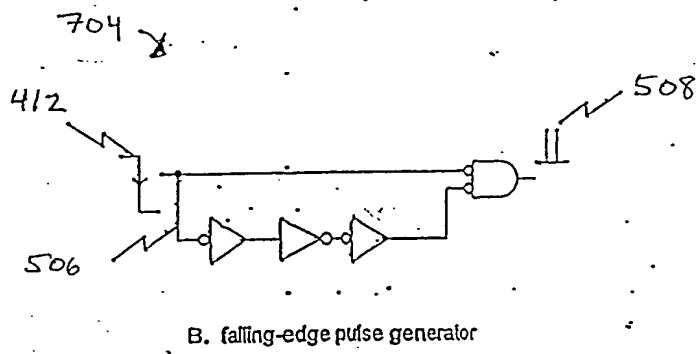


FIG. 7B

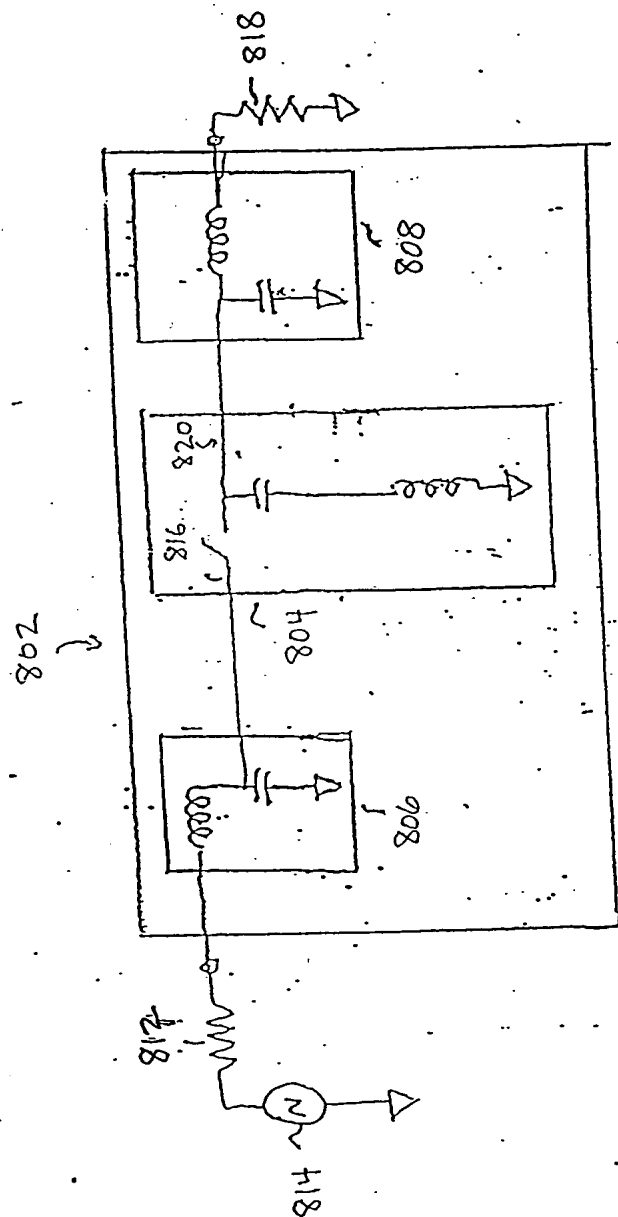


Fig. 8 - Impedance Matched Aliasing Module

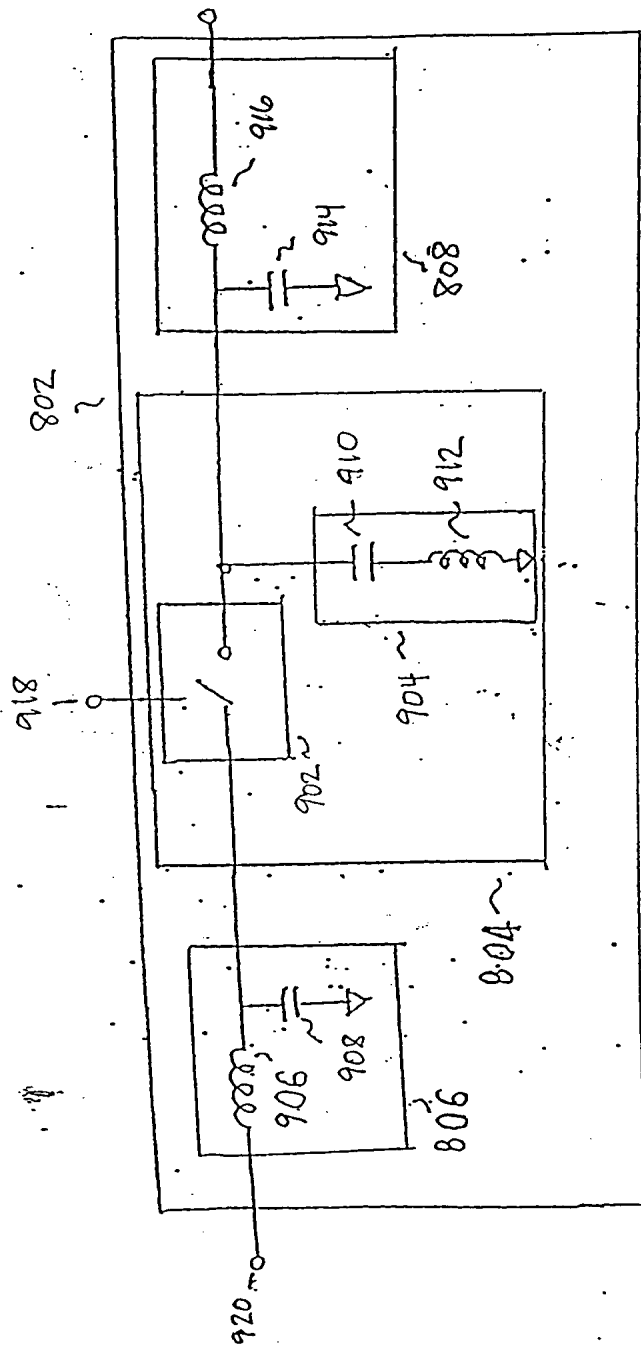


Fig 9 - Aliasing Module

Universal Frequency
Up-Conversion (UFU) module 1000

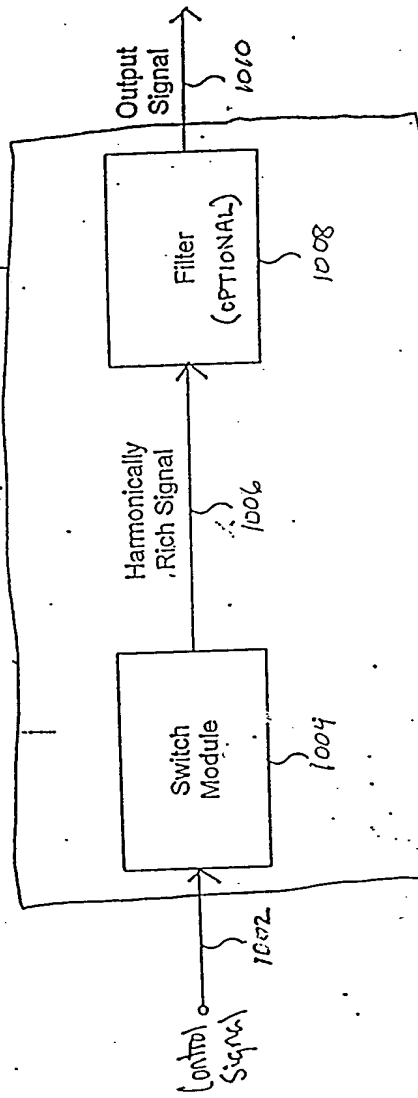


FIG. 10

Universal Frequency
Up-Conversion (VFC) module 1101

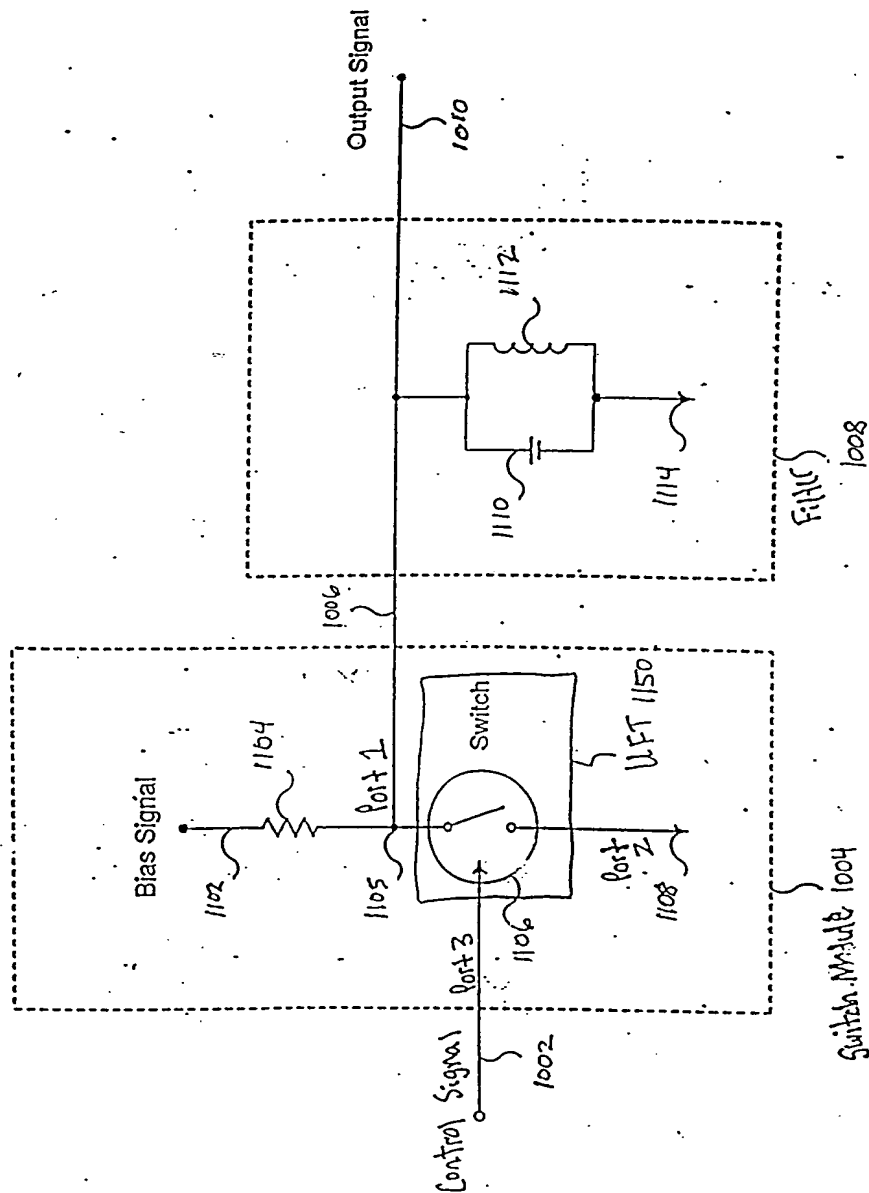


FIG. 11

Universal Frequency
Up-Conversion
(UFU) module 1290

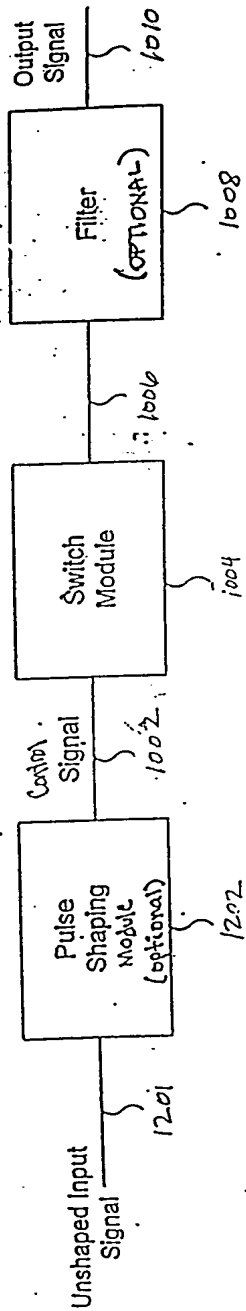
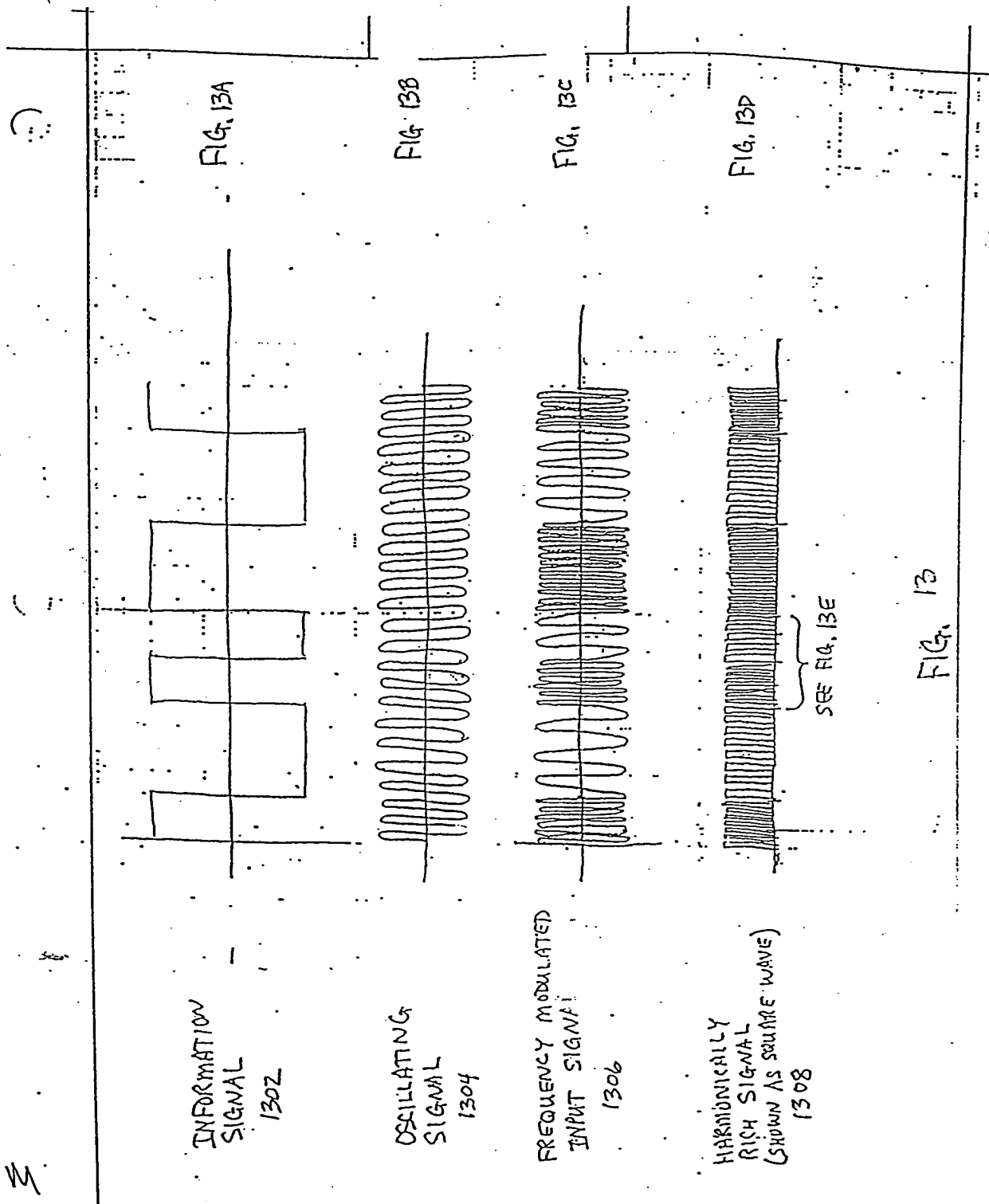


FIG. 12



EXPANDED VIEW OF
HARMONICALLY RICH
SIGNAL 1308

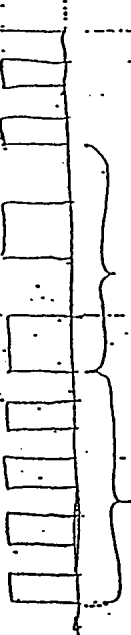


FIG 13E

HARMONICS OF
SIGNAL 1310
(SHOWN SEPARATELY)

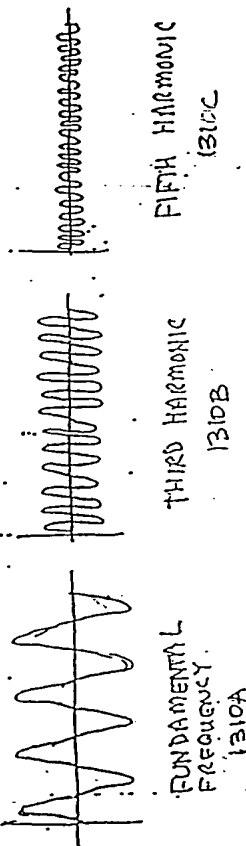


FIG 13F

HARMONICS OF
SIGNAL 1312
(SHOWN SEPARATELY)

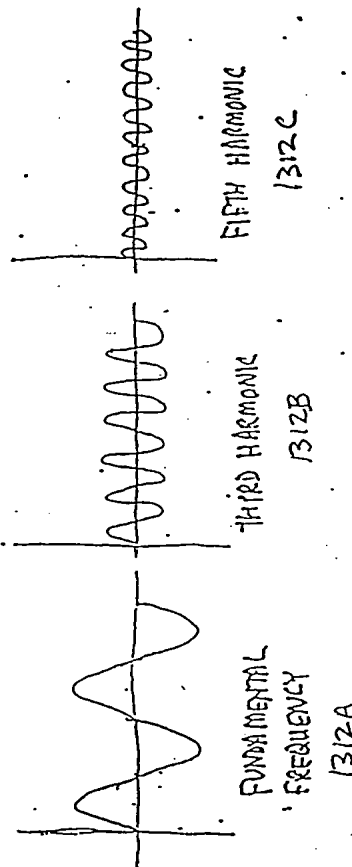


FIG 13G

FIG. 13 (cont)

HARMONICS OF
SIGNALS 1310 AND
1312. (SHOWN
SIMULTANEOUSLY BUT
NOT SUMMED)

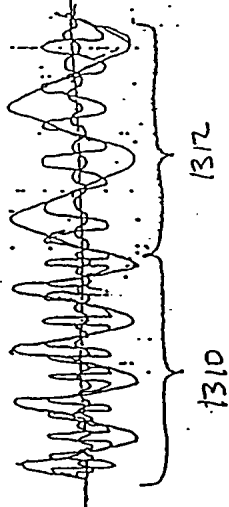


FIG. 13H

ALTERED
OUTPUT
SIGNAL
1314

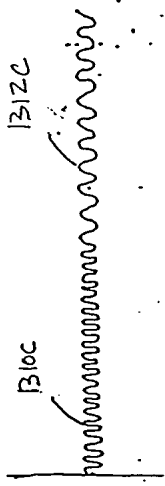


FIG. 13I

FIG. 13 (cont.)

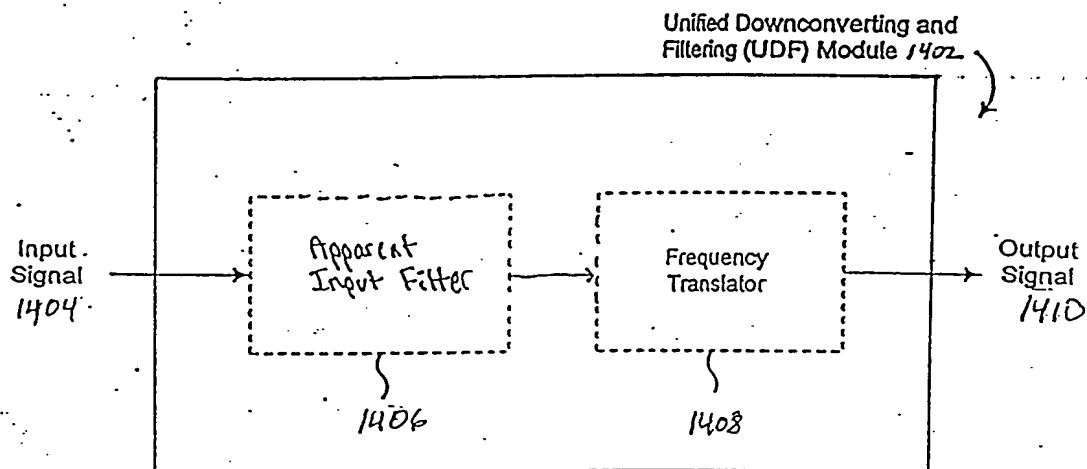


FIG. 14

m

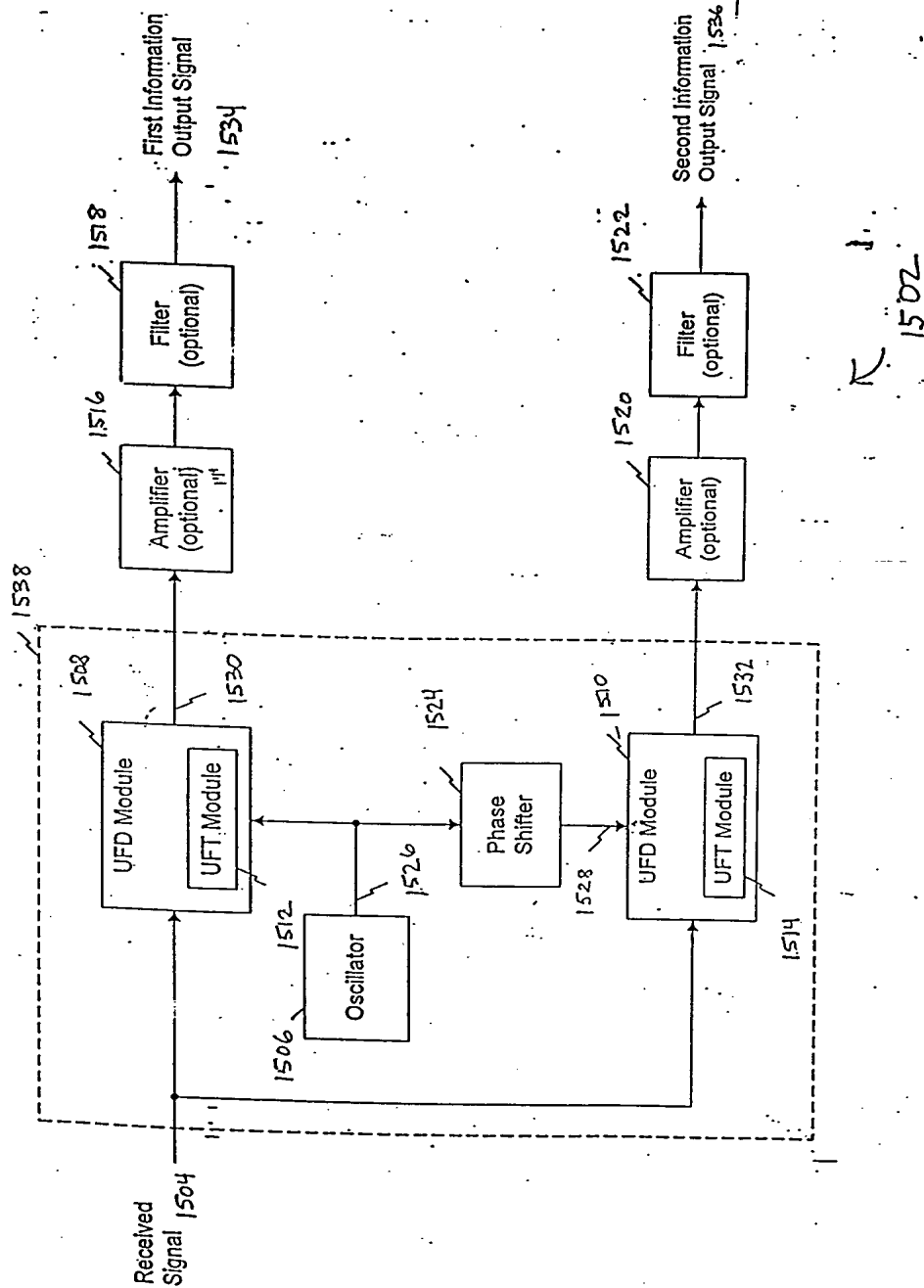


FIG. 15

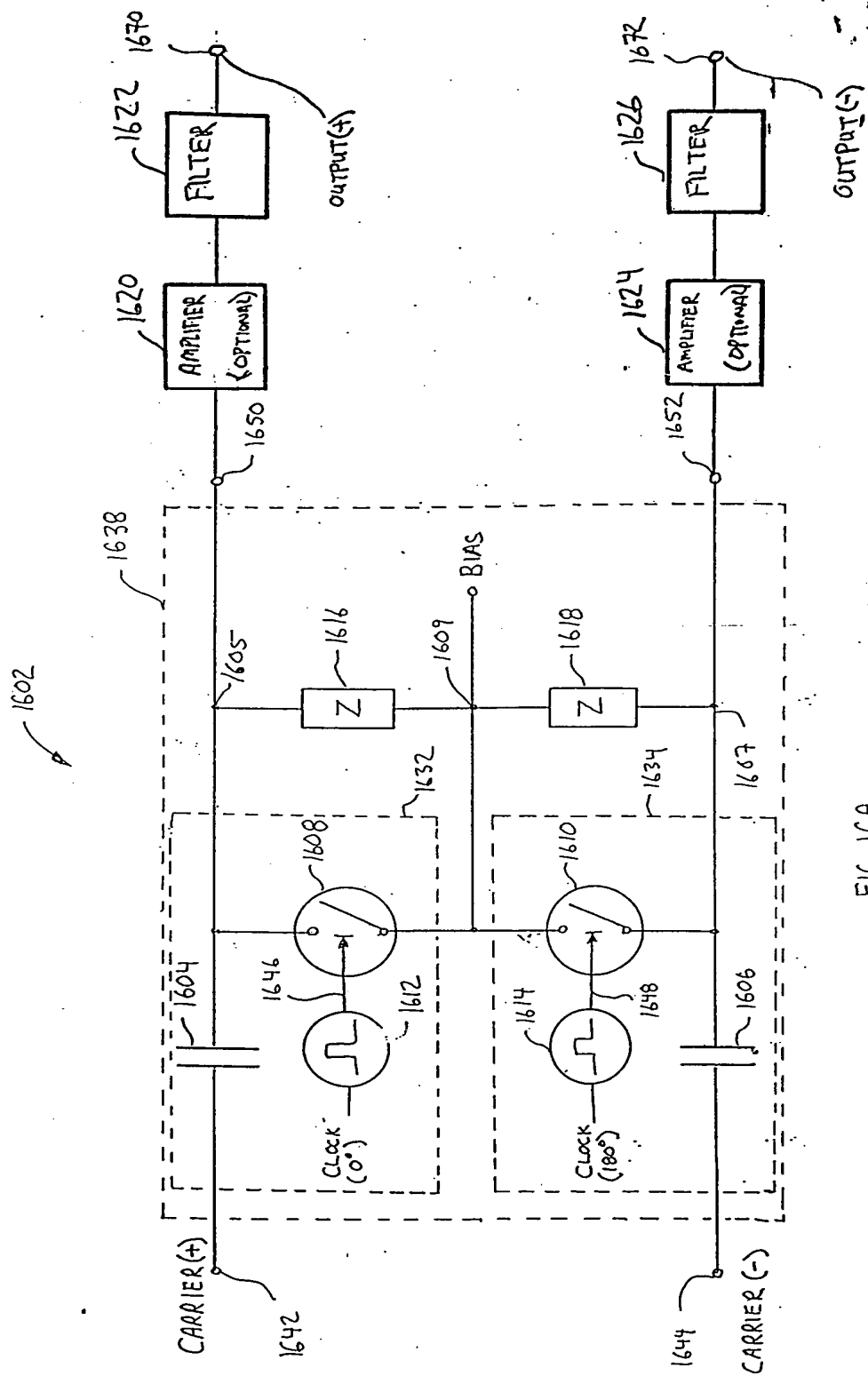


FIG. 16A

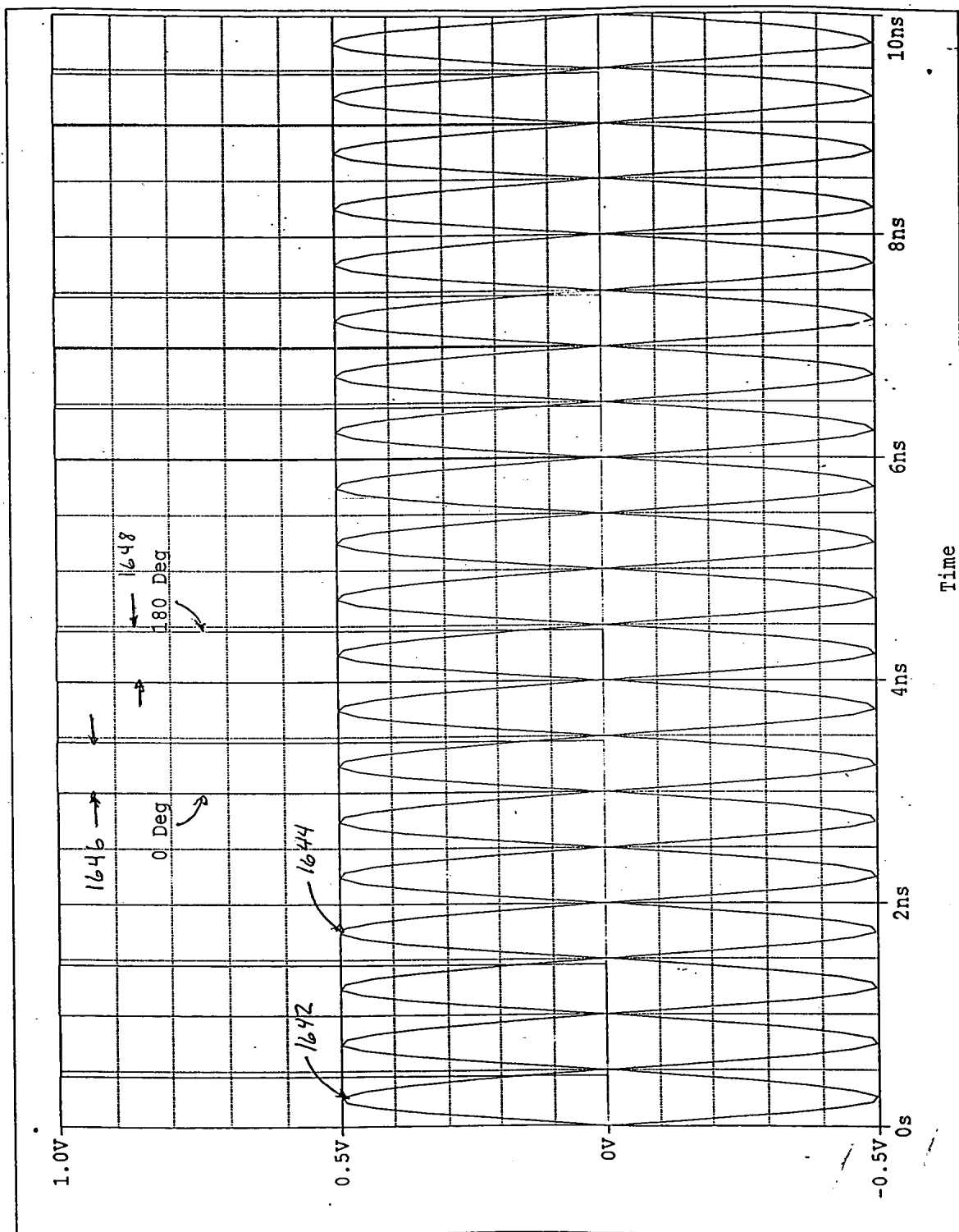


FIG. 16 B

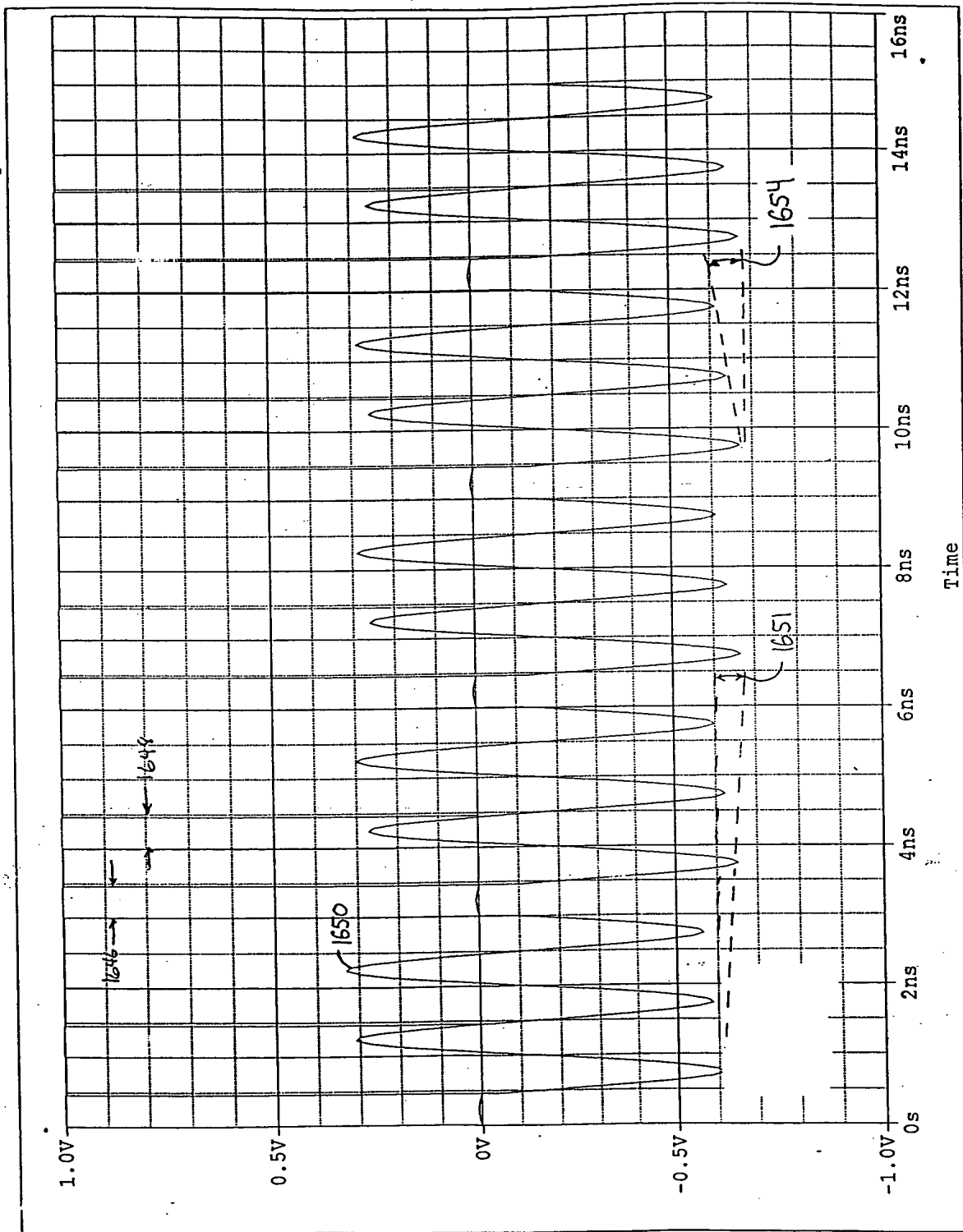


FIG. 16C

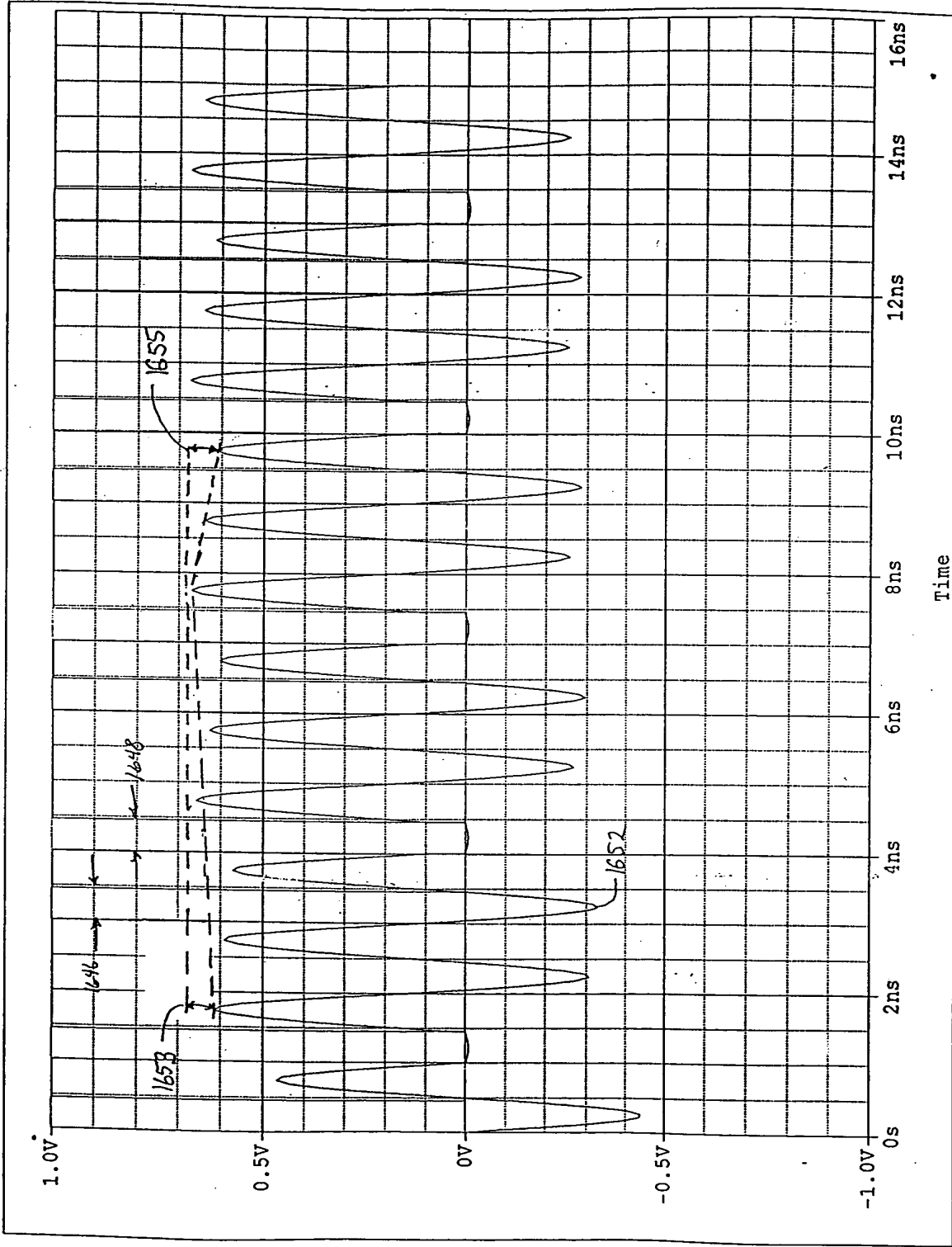


FIG. 16 D

FO9T50" T585860

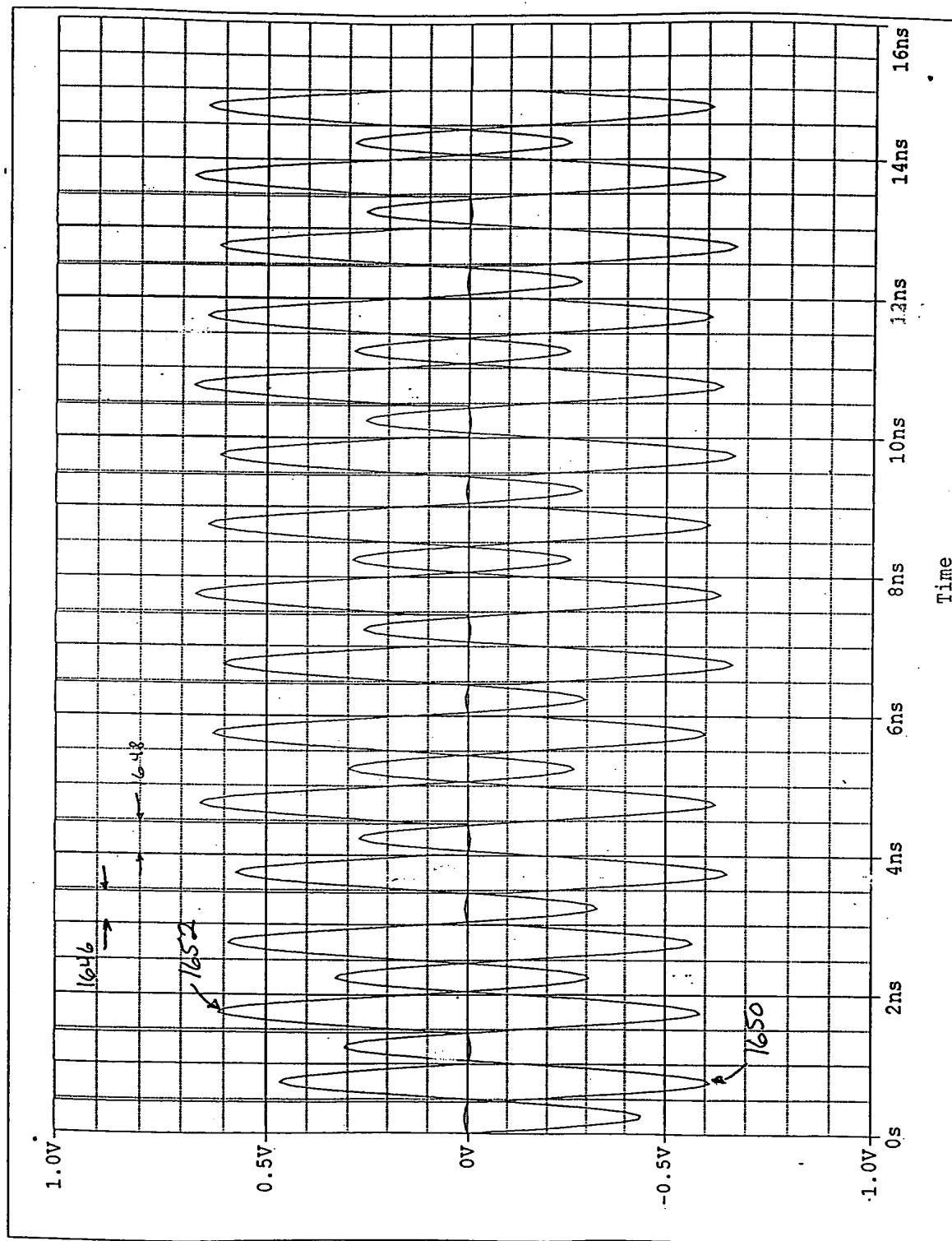


FIG. 16 E

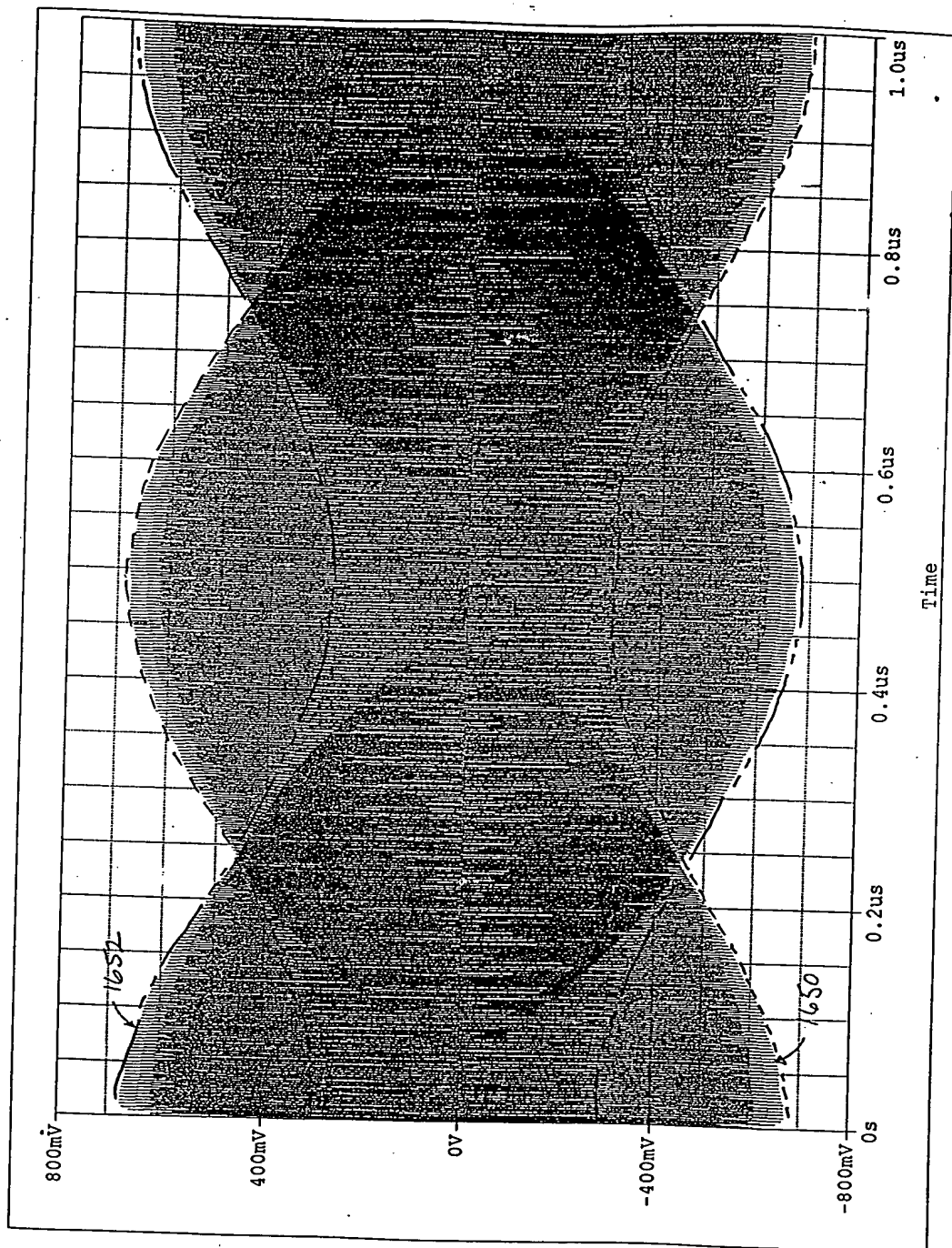


FIG. 16 F

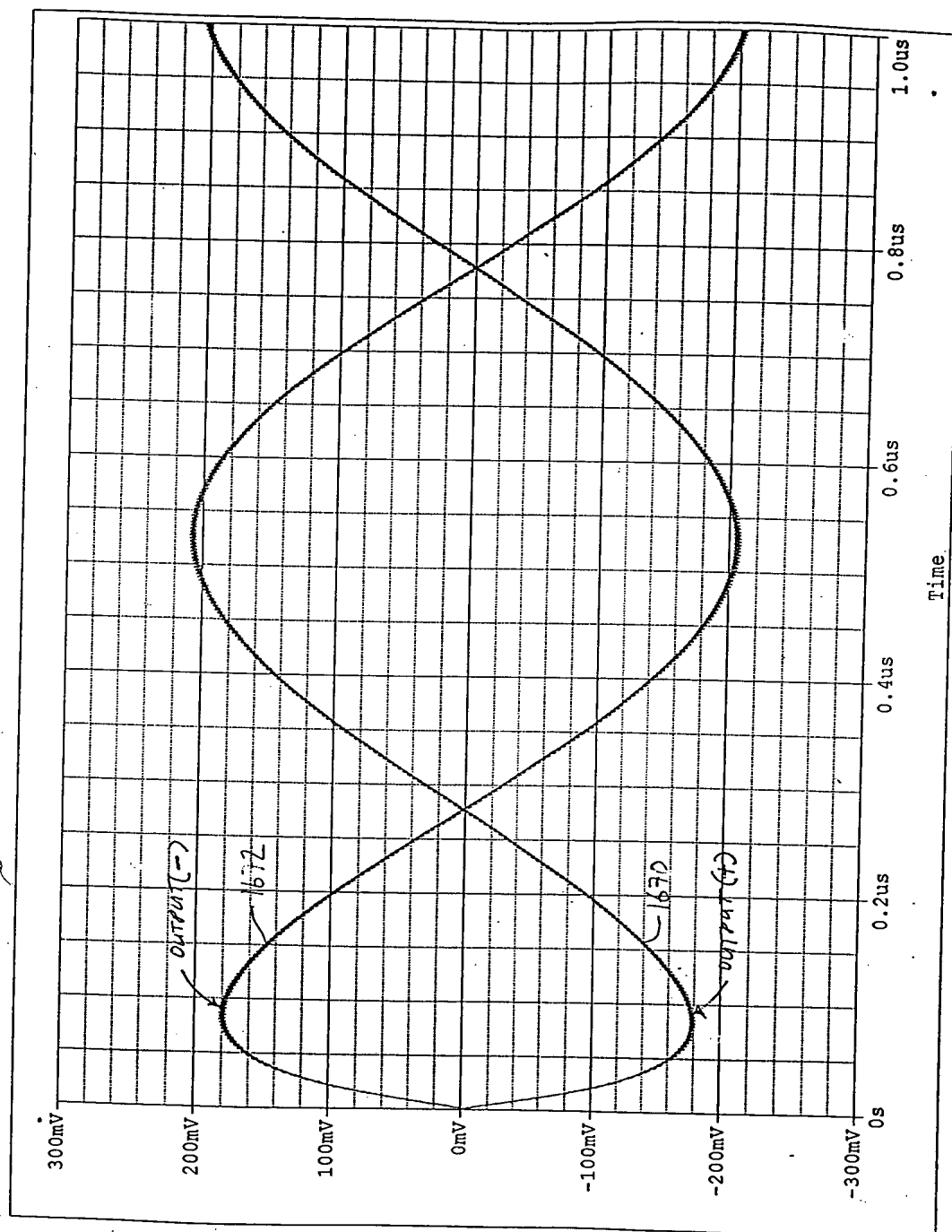


FIG. 16 G

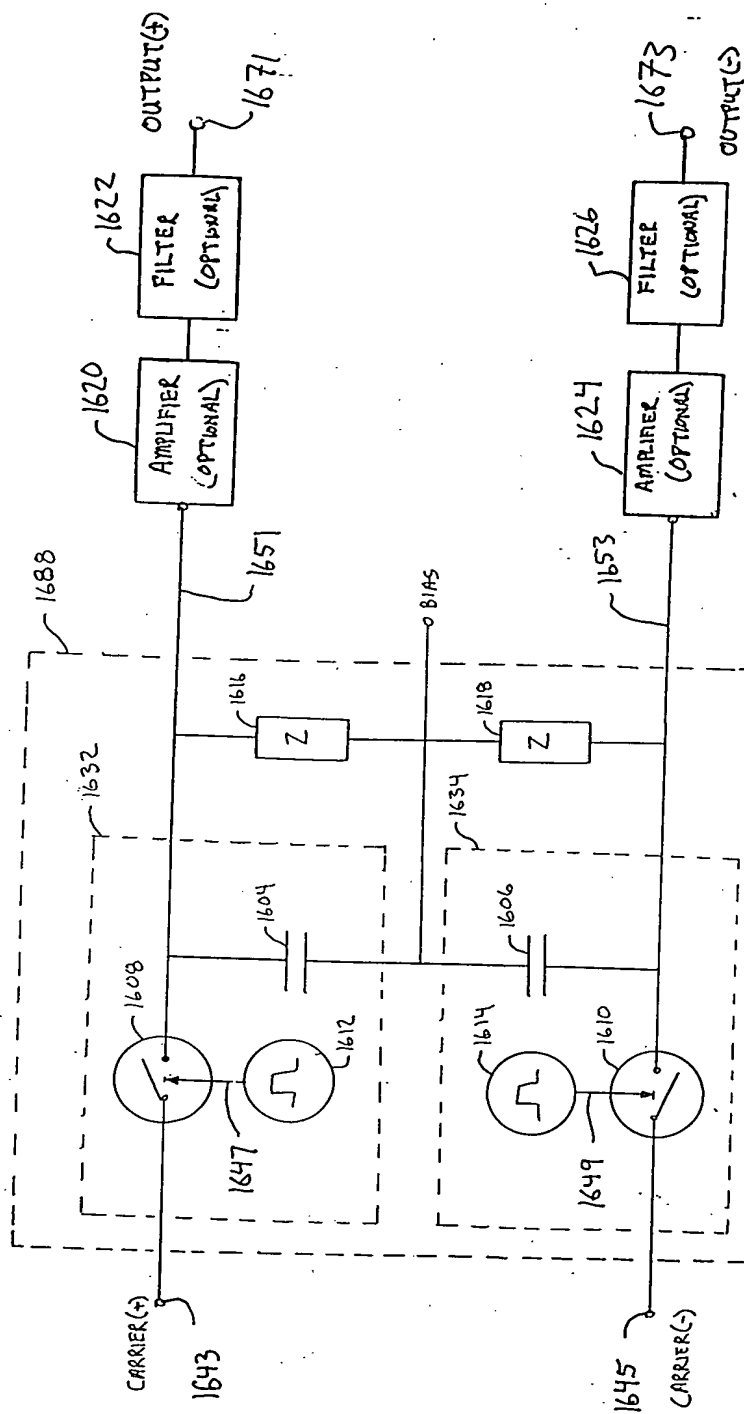


FIG. 16H

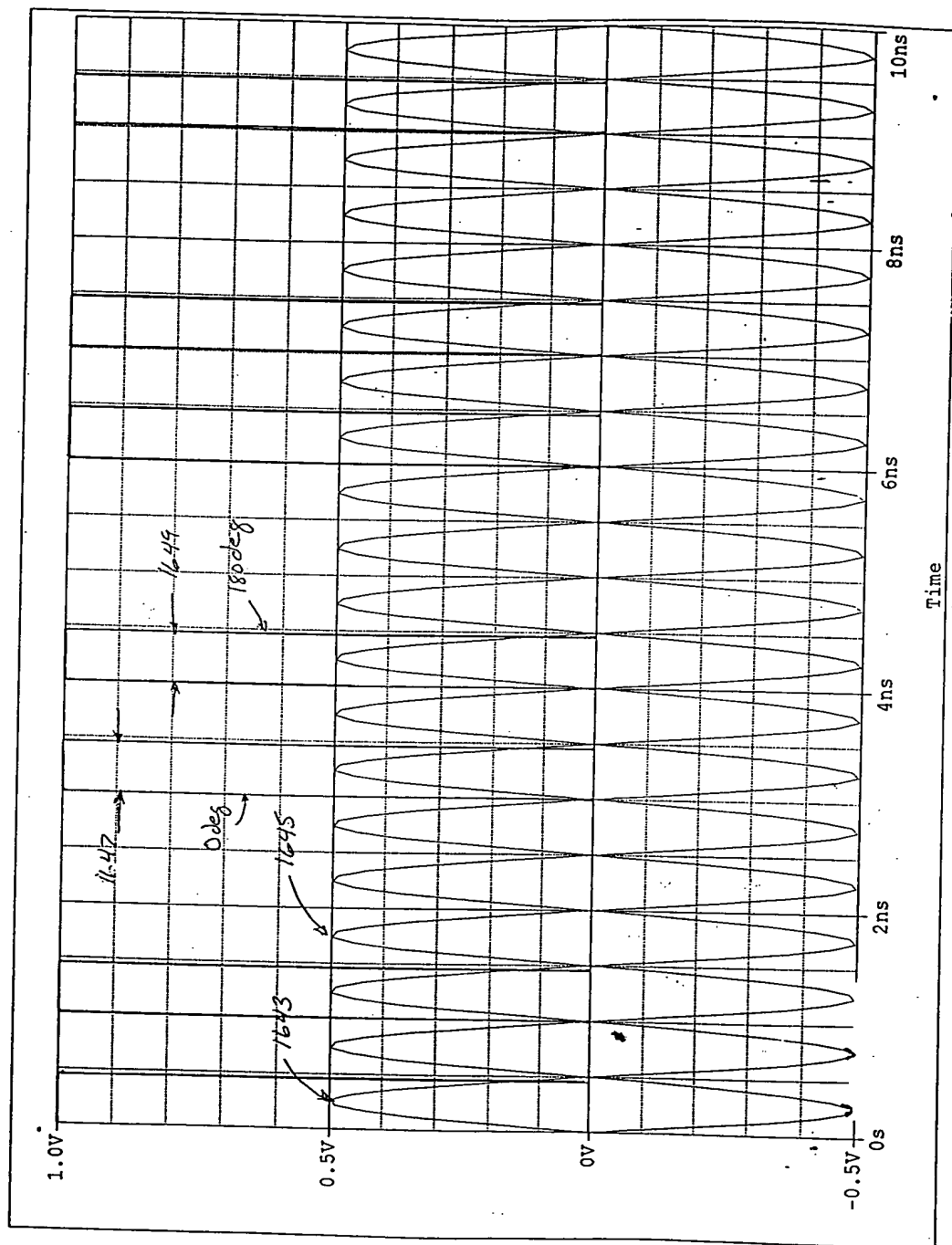


FIG. 16I

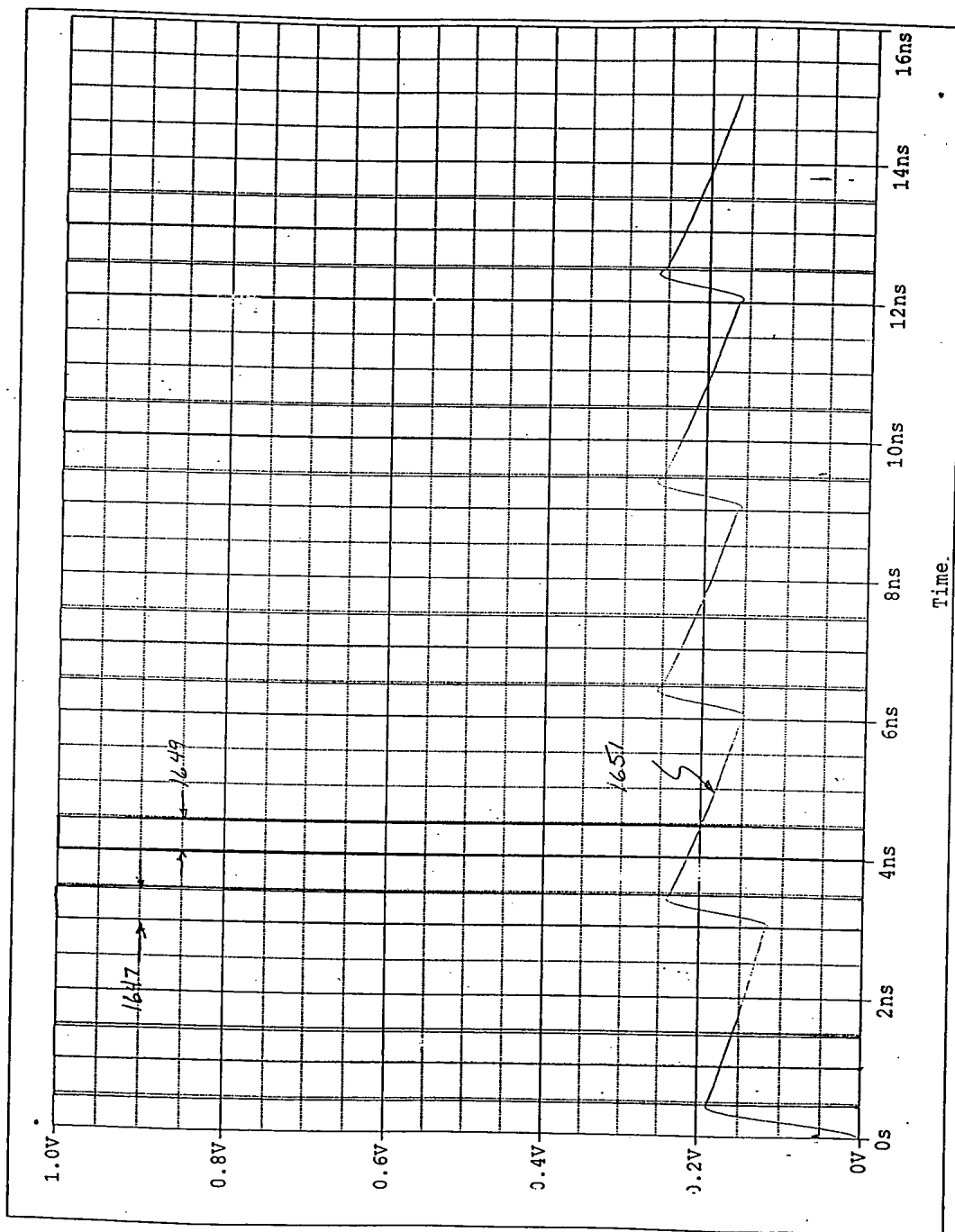


FIG 16J

09855860 05100 T585860

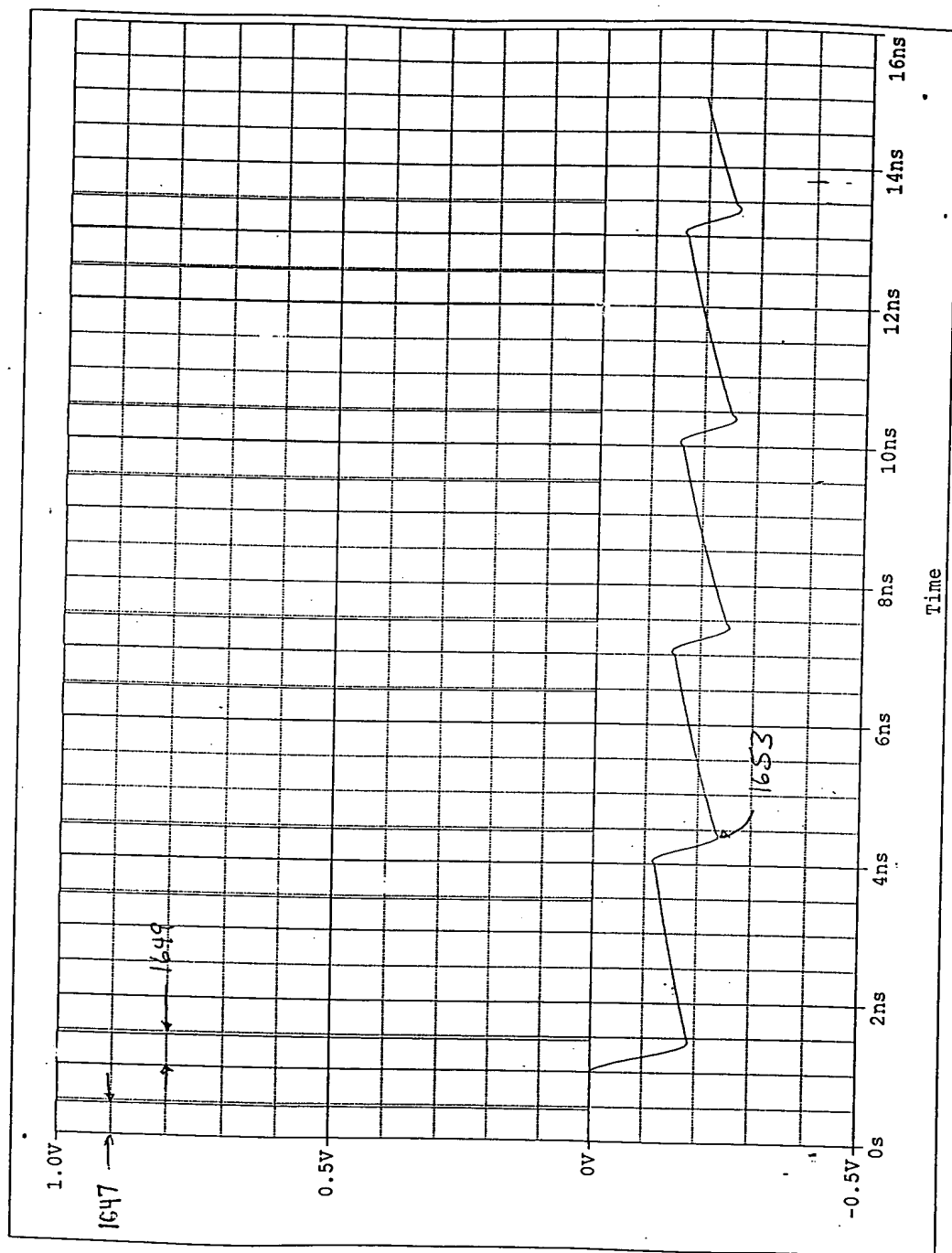


FIG. 16K

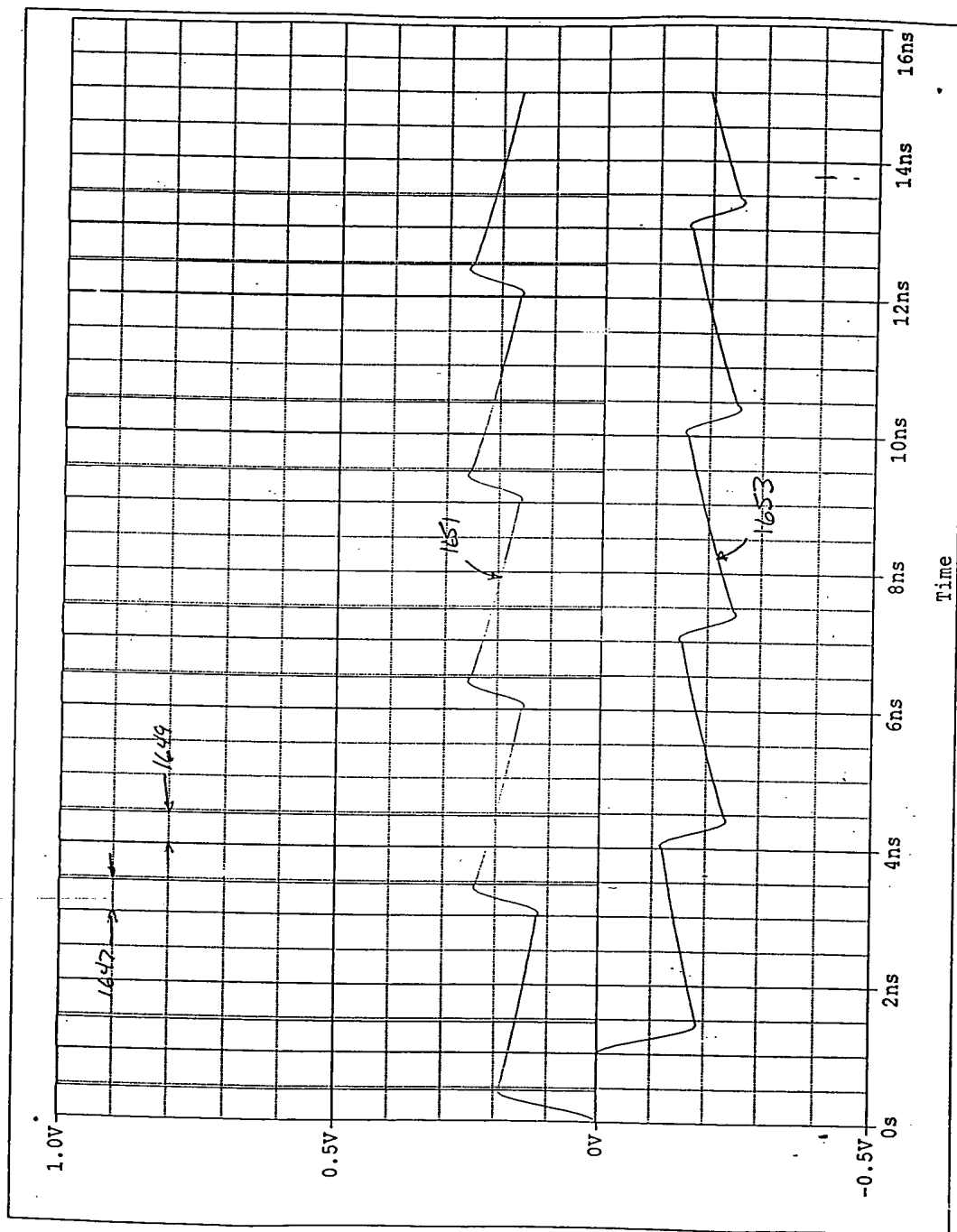


FIG. 16L

FO9T50" F5855860

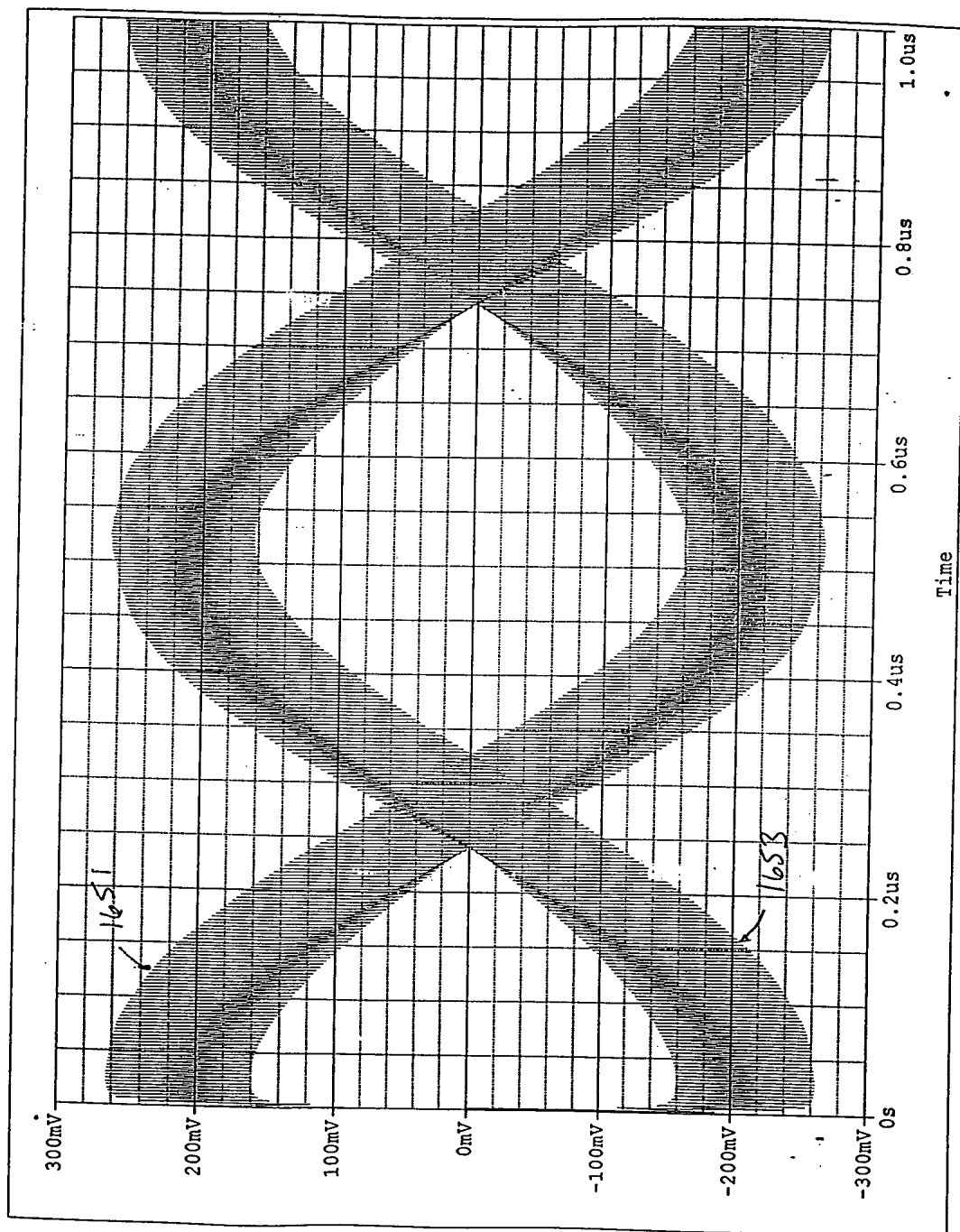


FIG. 16M

TOP SECRET 1585860

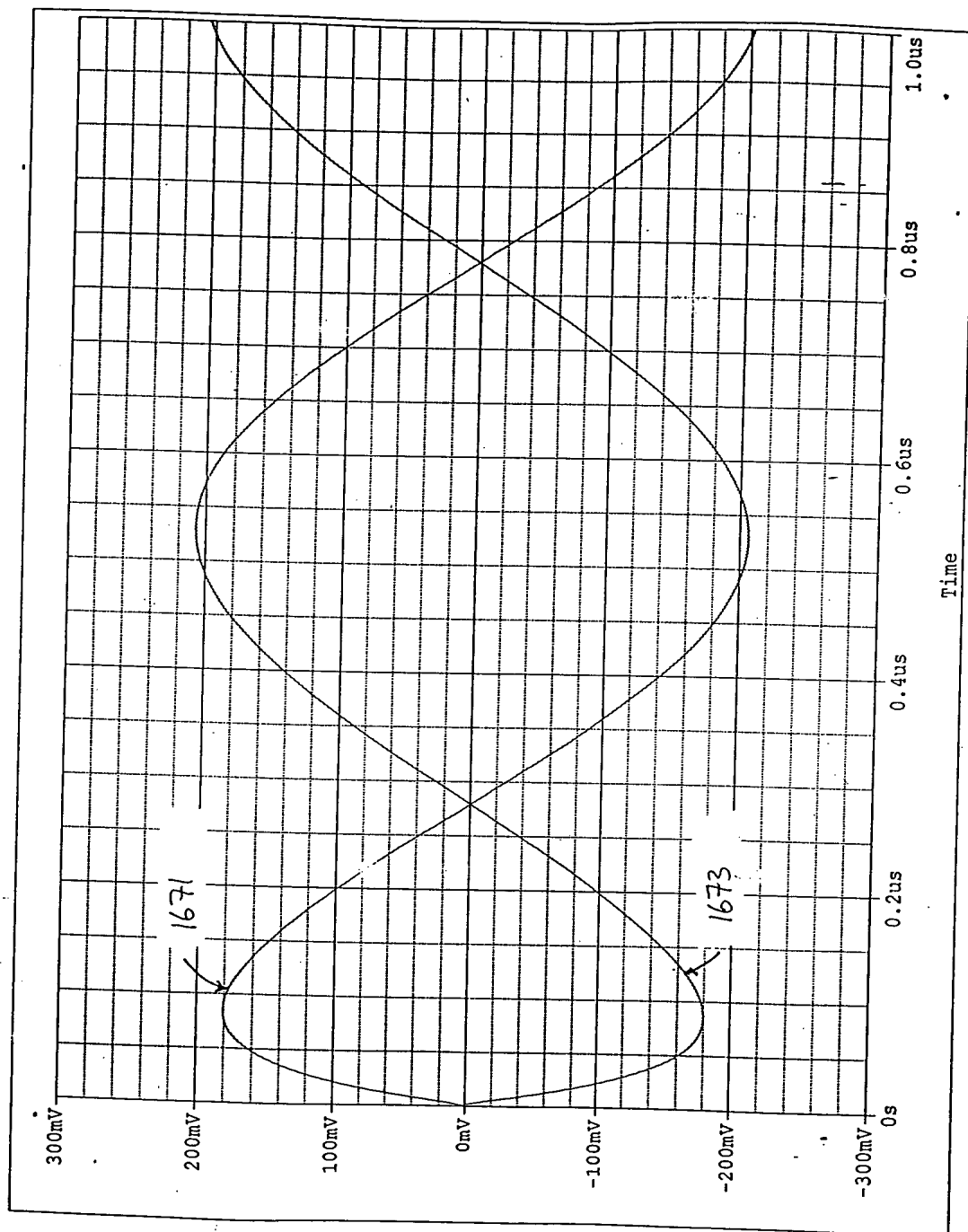


FIG. 16N

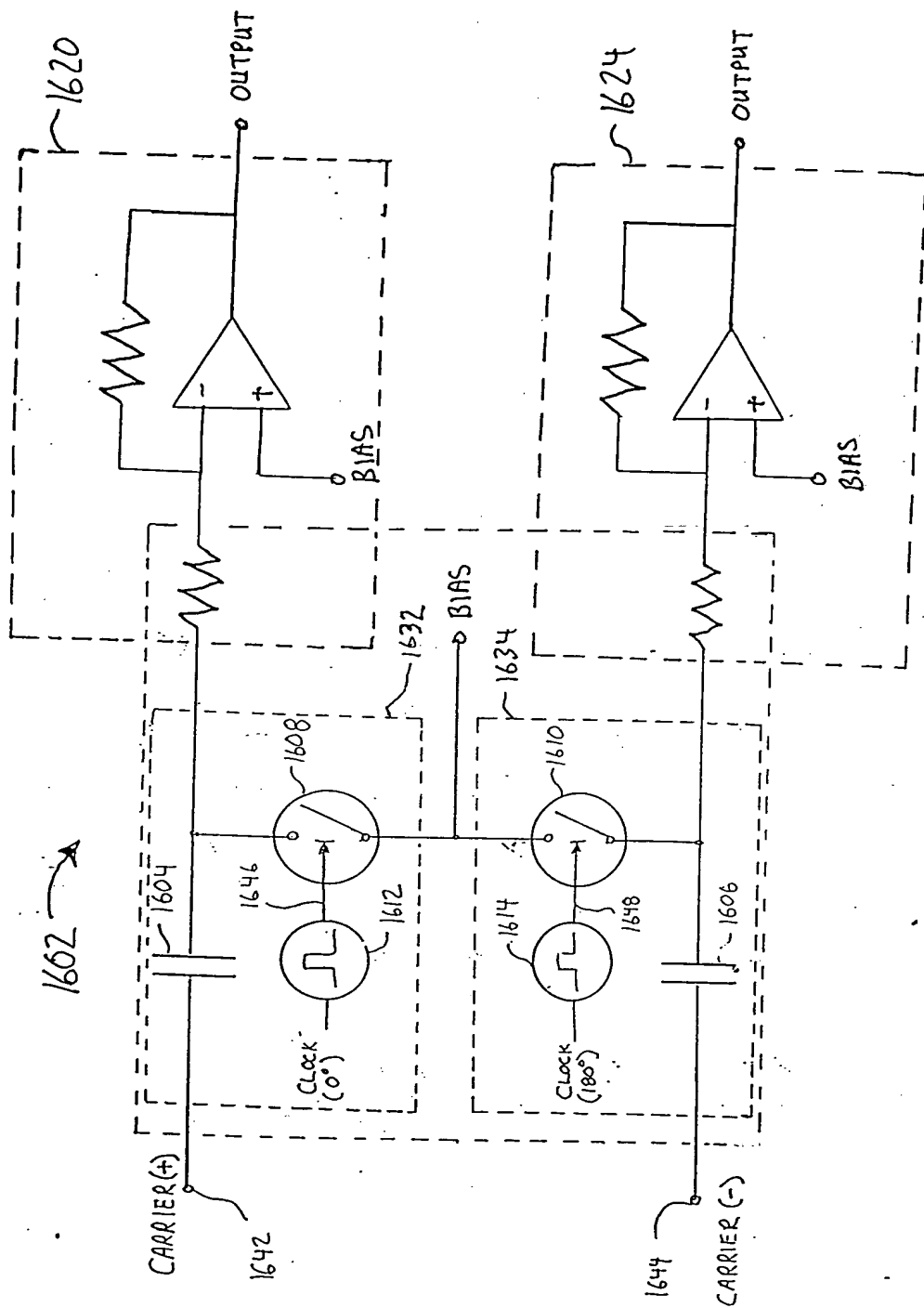


FIG. 160

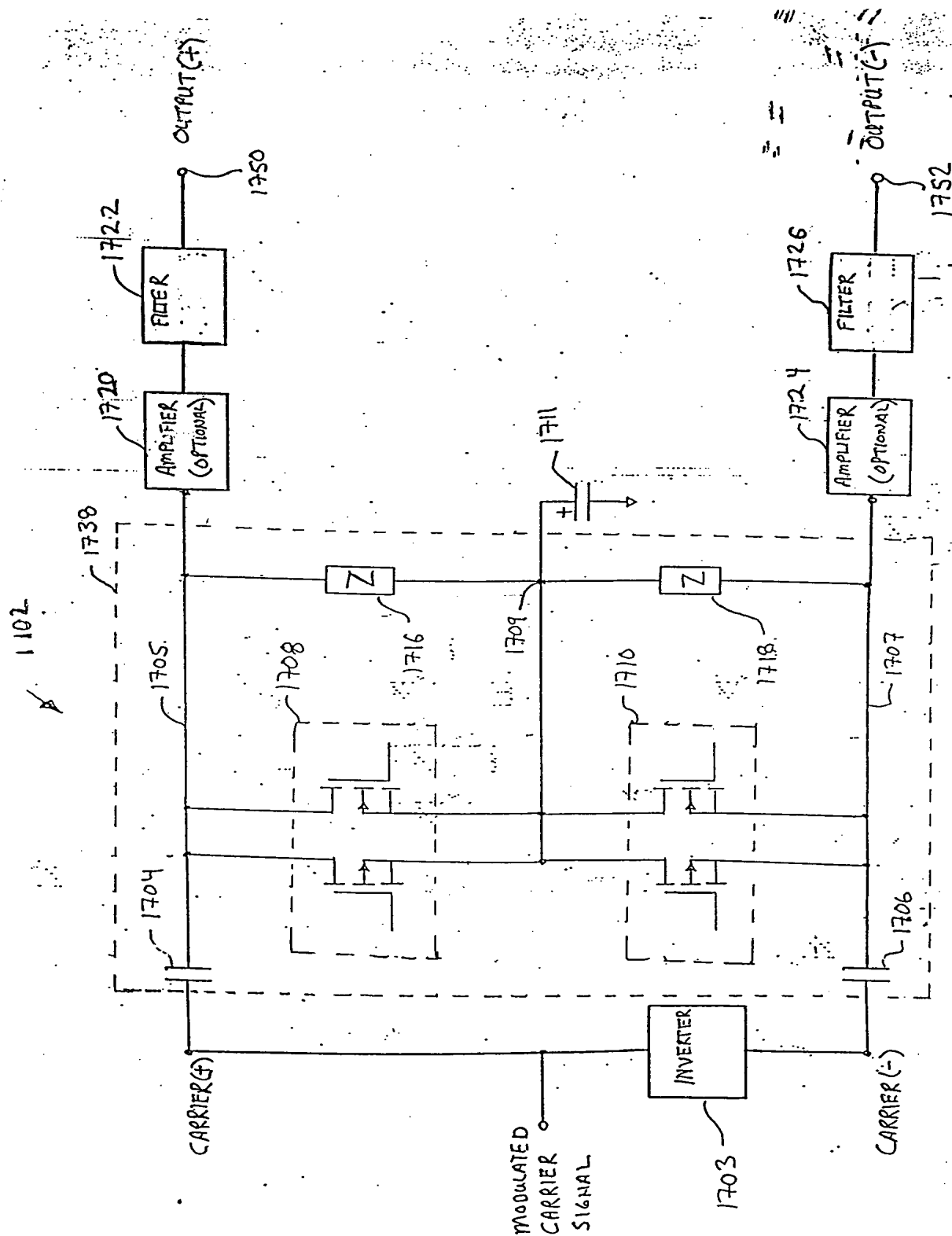
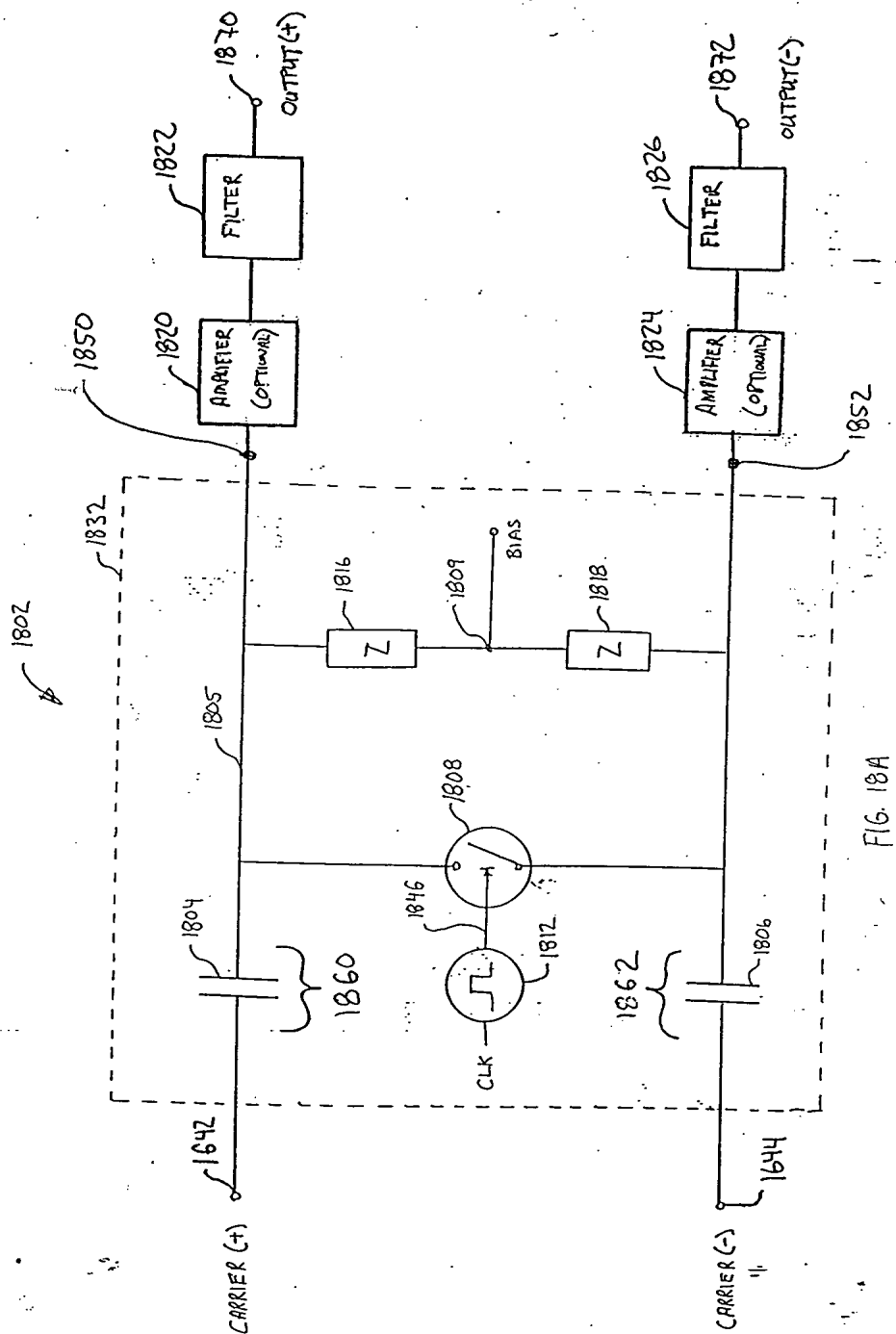


FIG. 16



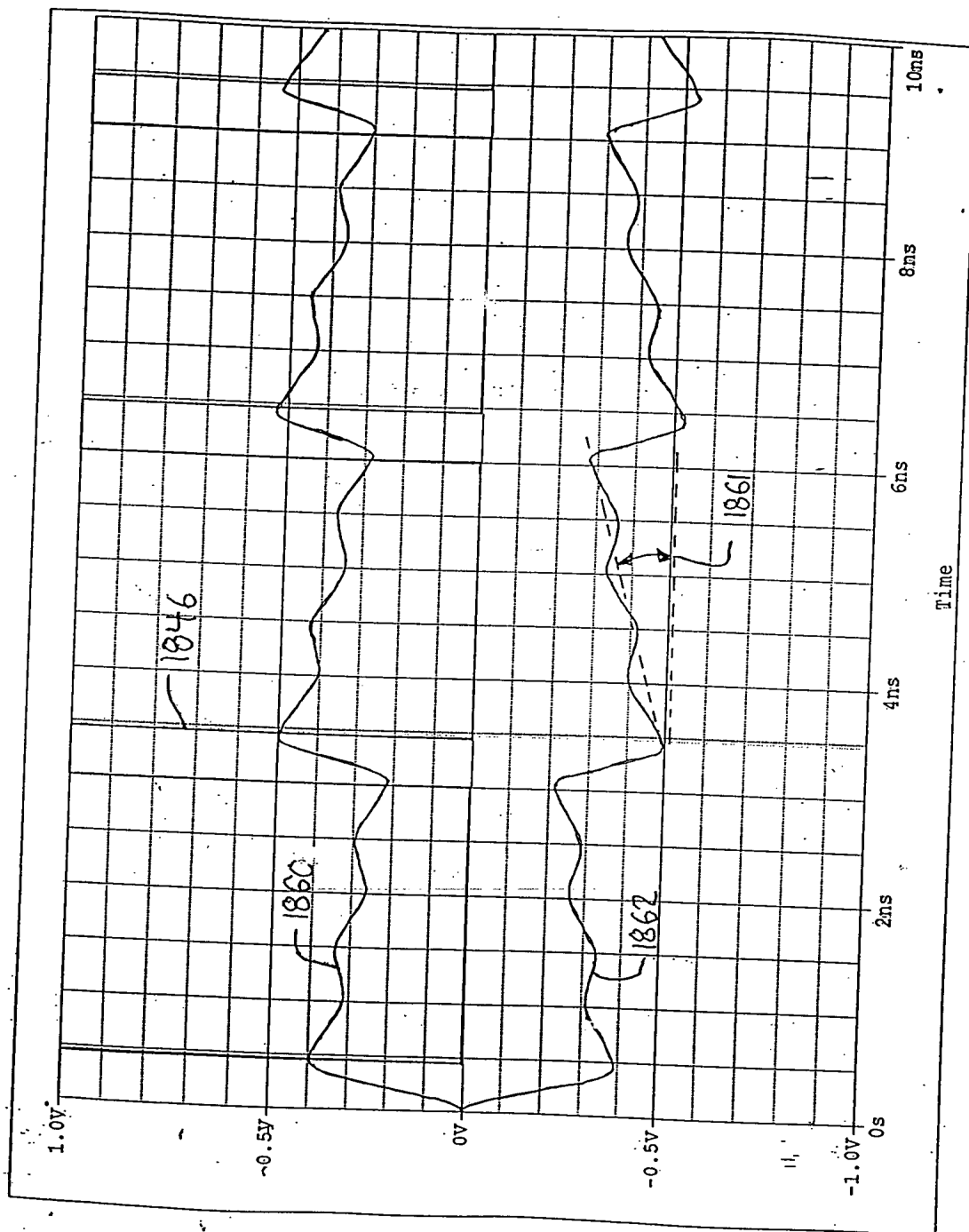


FIG. 18B

FO9T50" T5855860

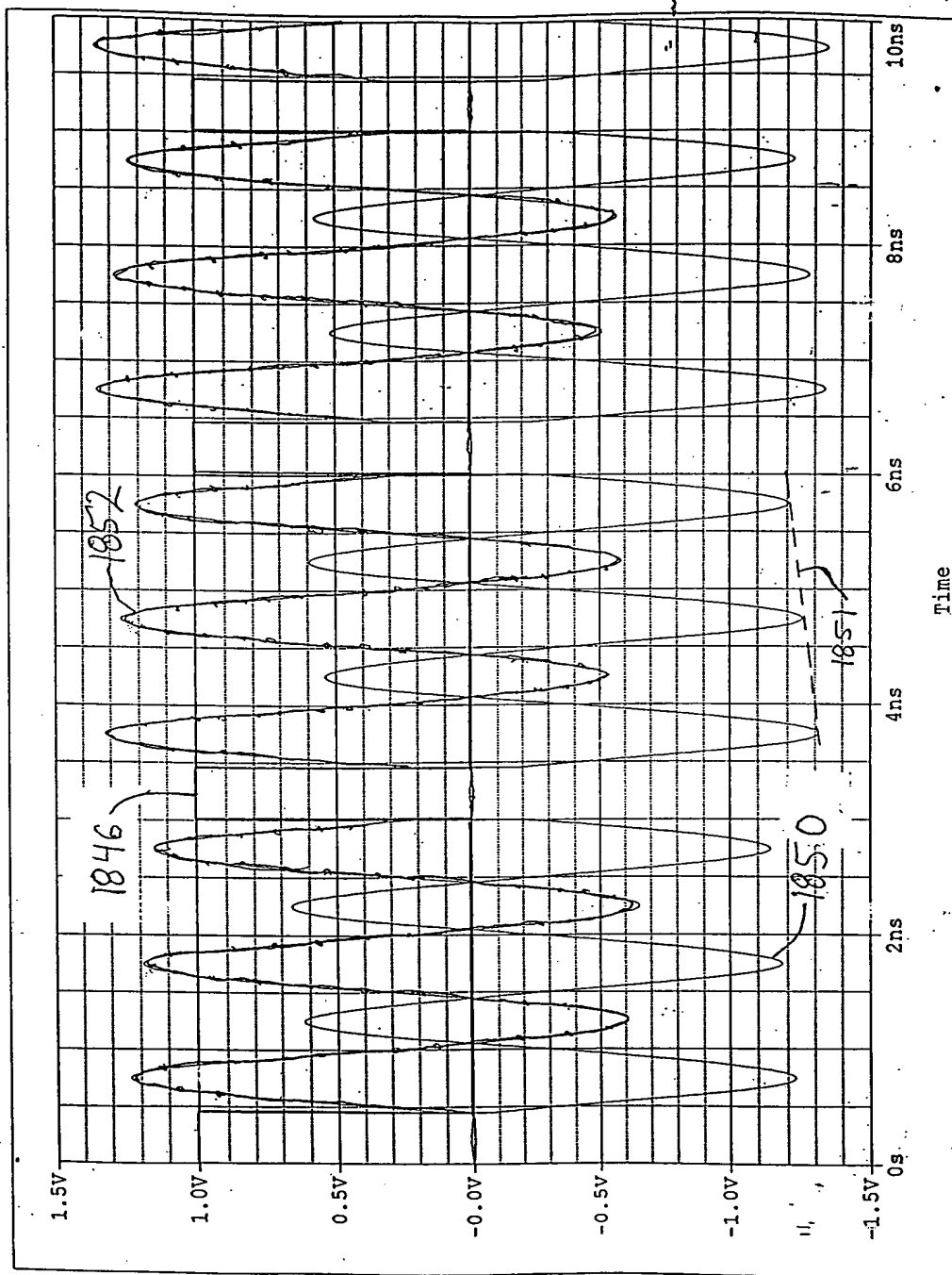


FIG. 18C

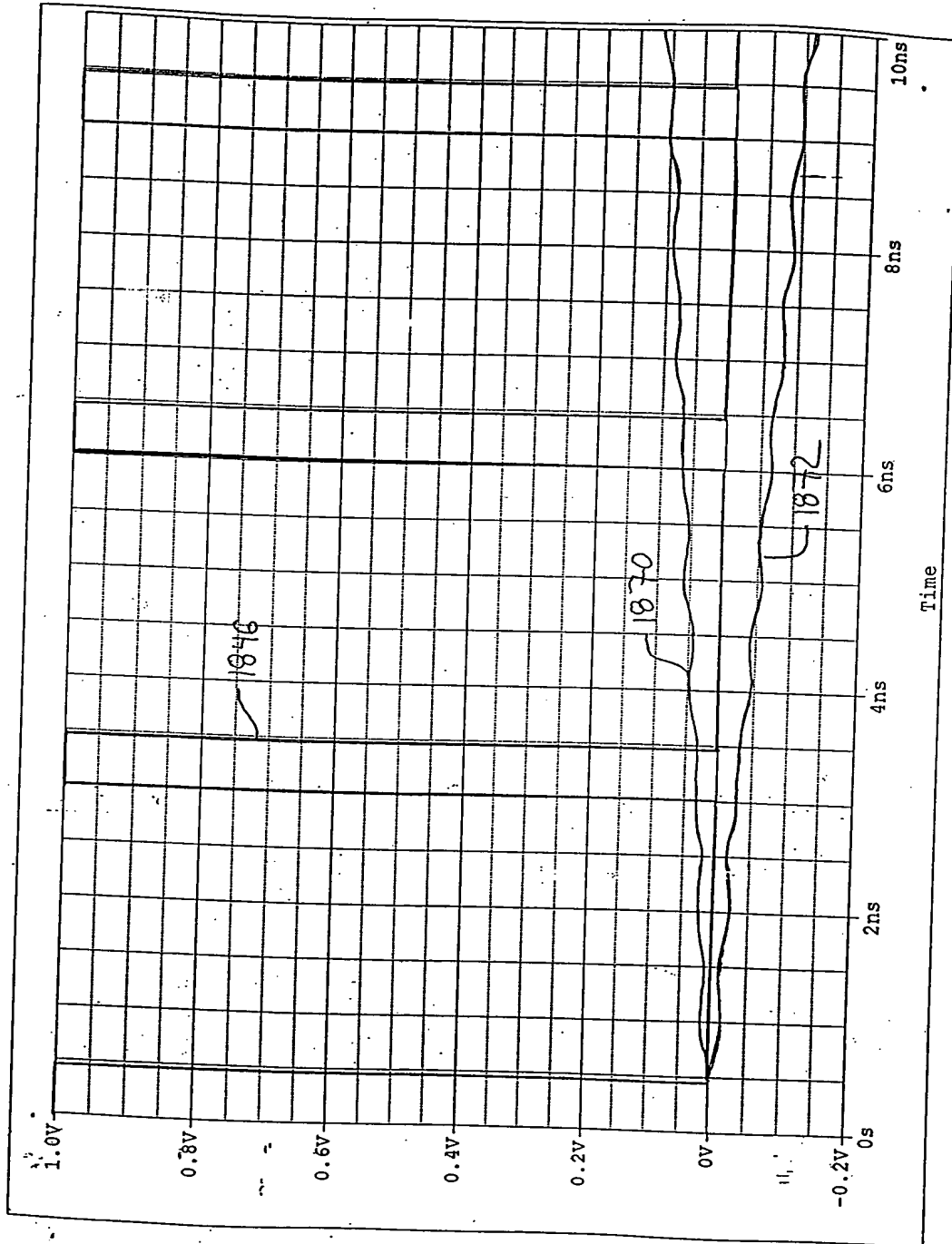


FIG. 18D

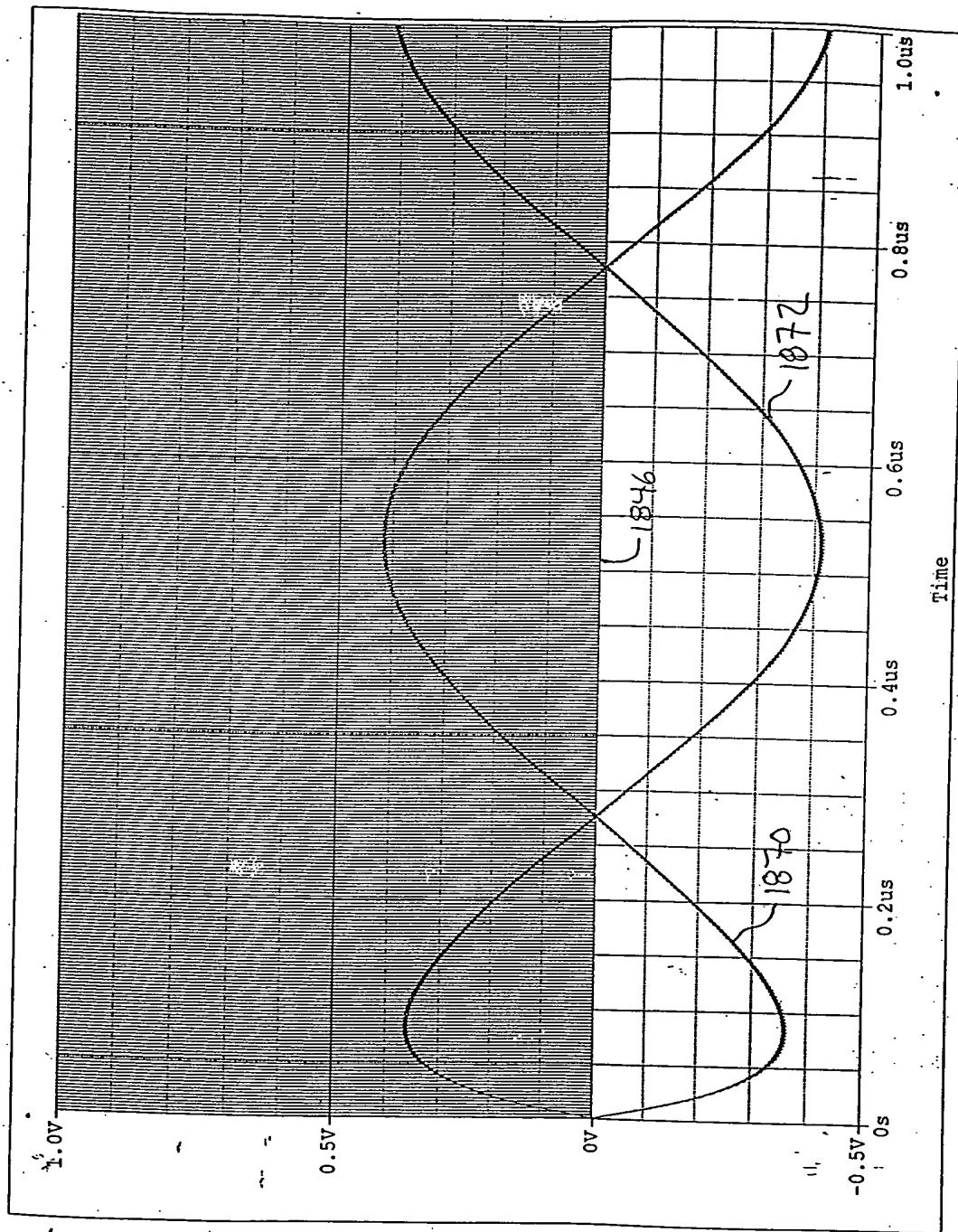


FIG. 18E

1902

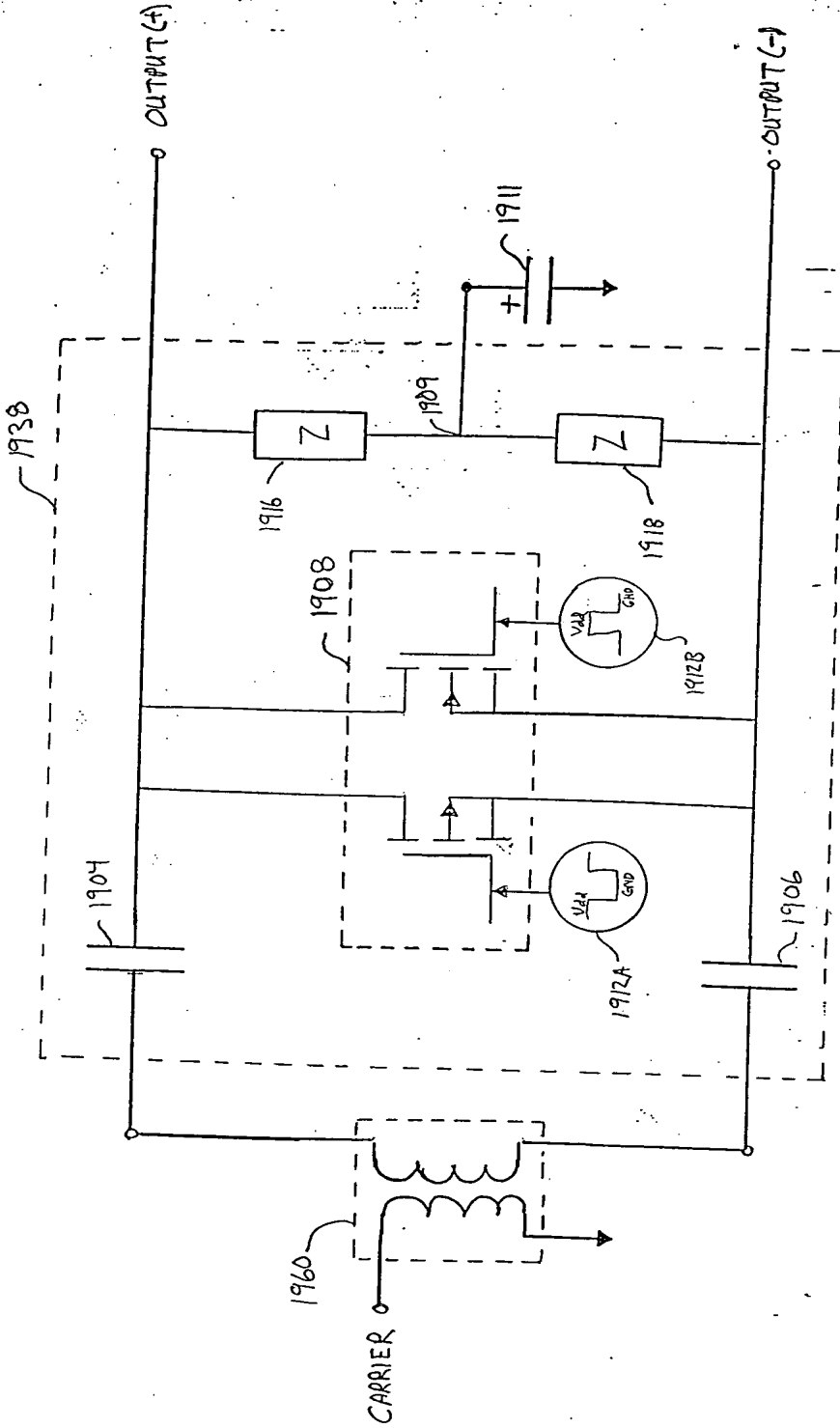


FIG. 19

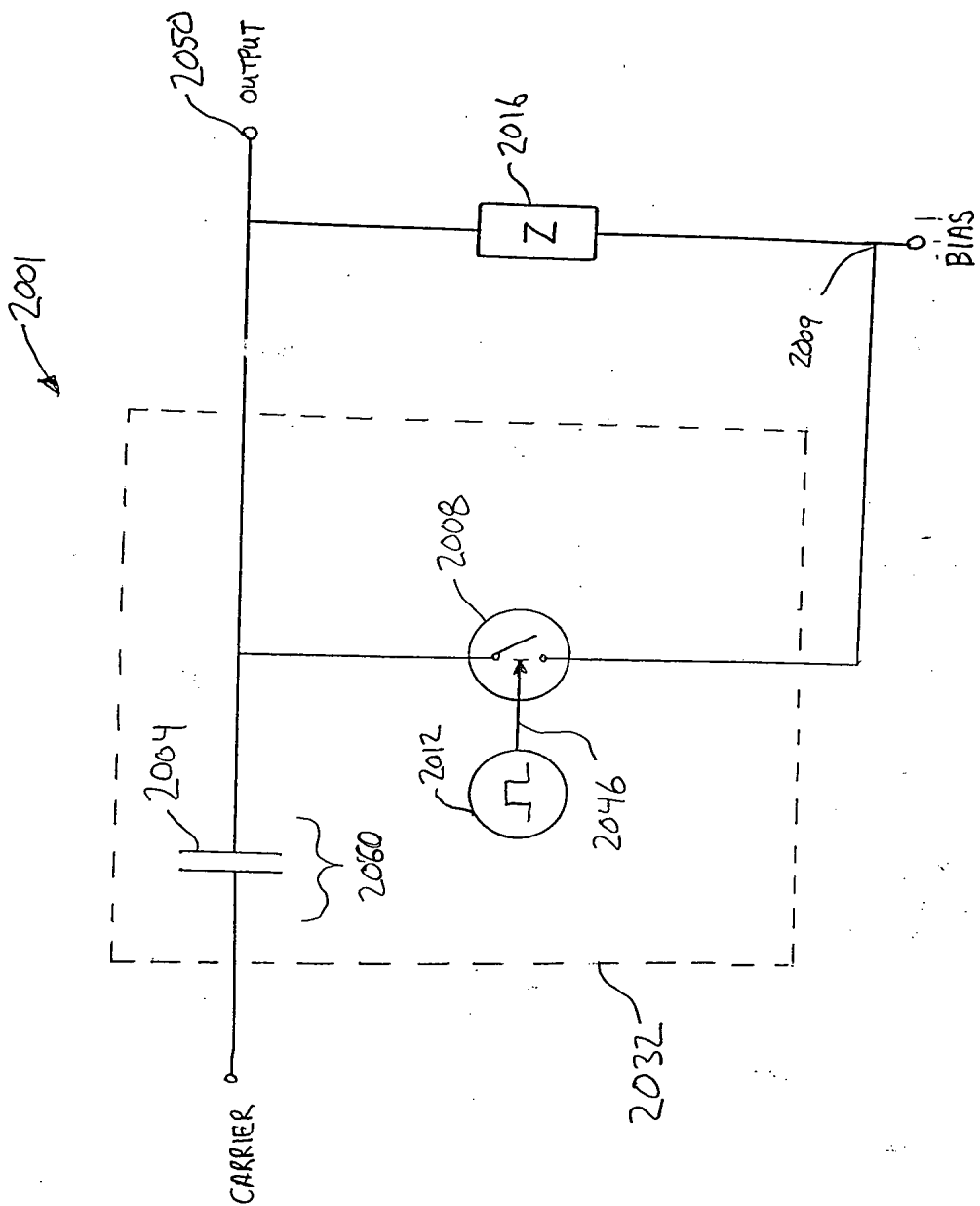


FIG. 20A

TESTED TSS850

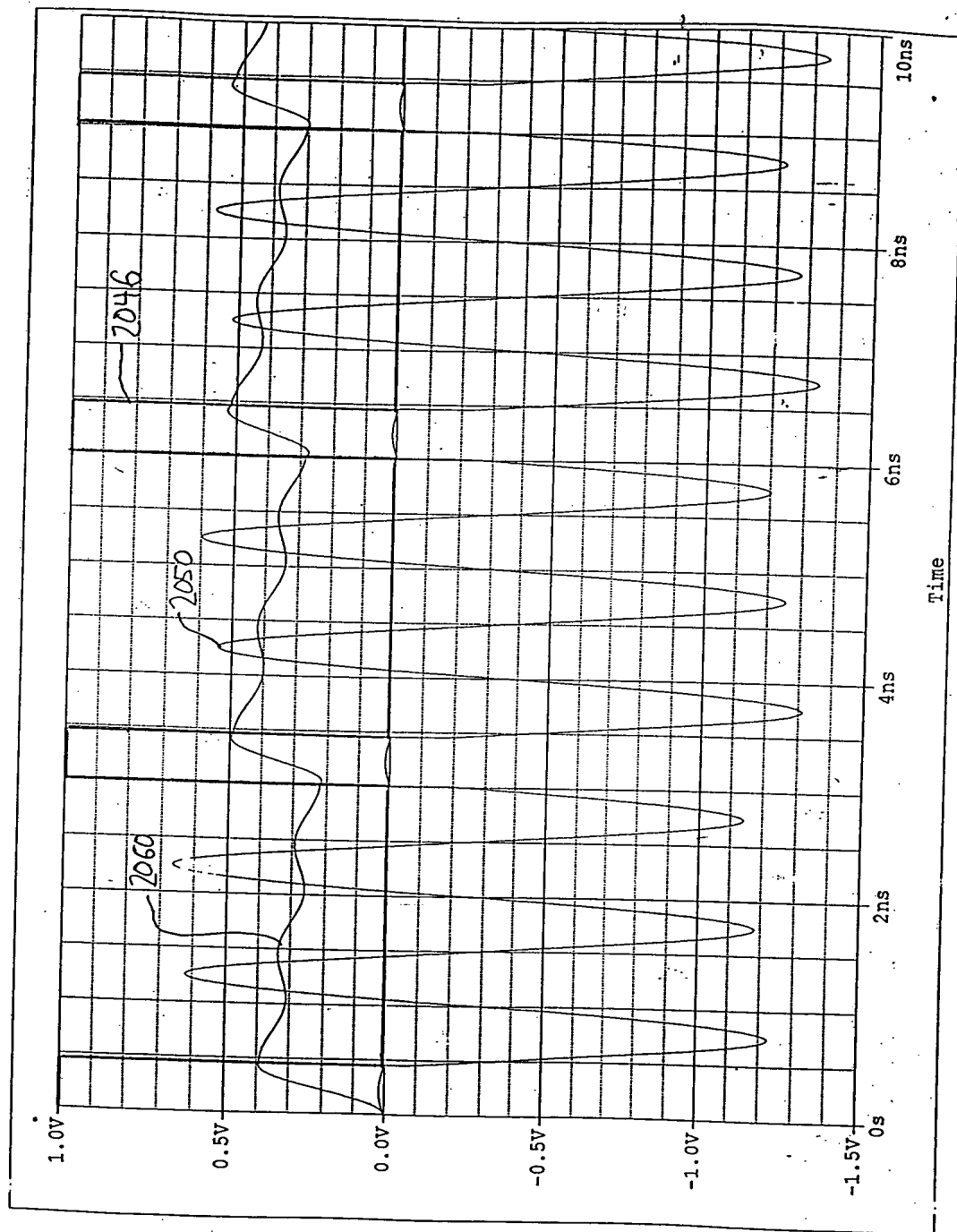


FIG. 20B

098584 0460
T09T50" T5855860

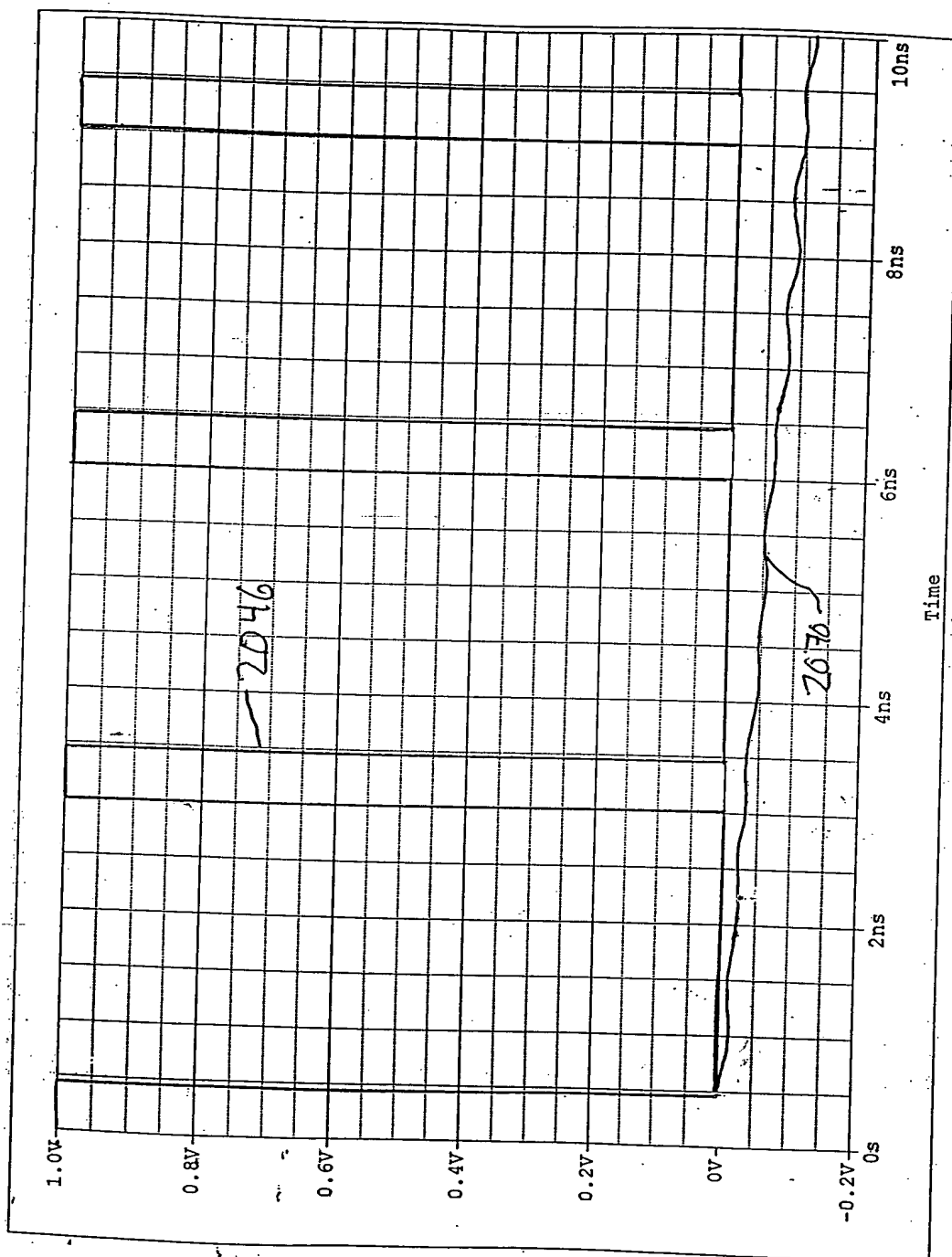


FIG. 20C

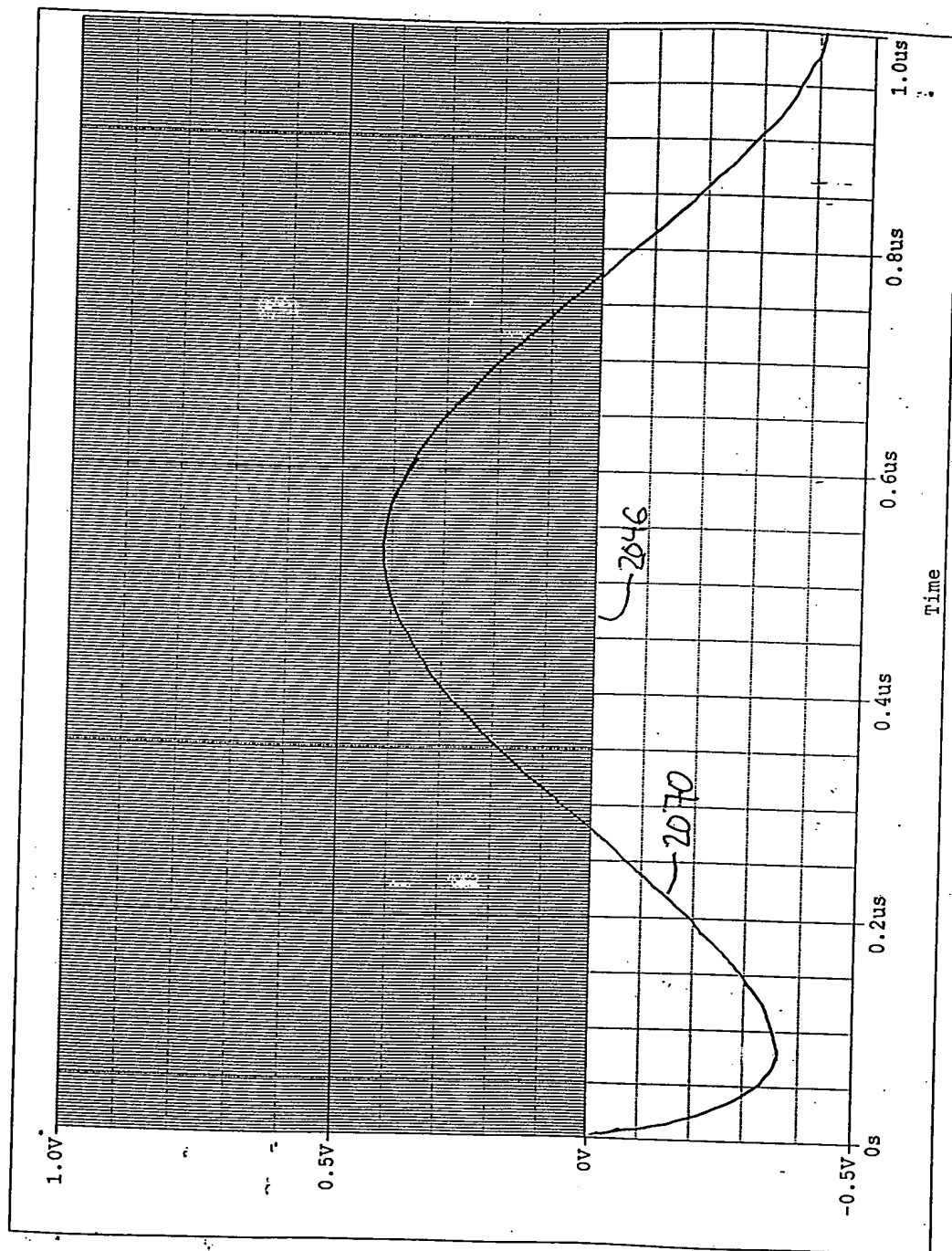


FIG. 20D

2002

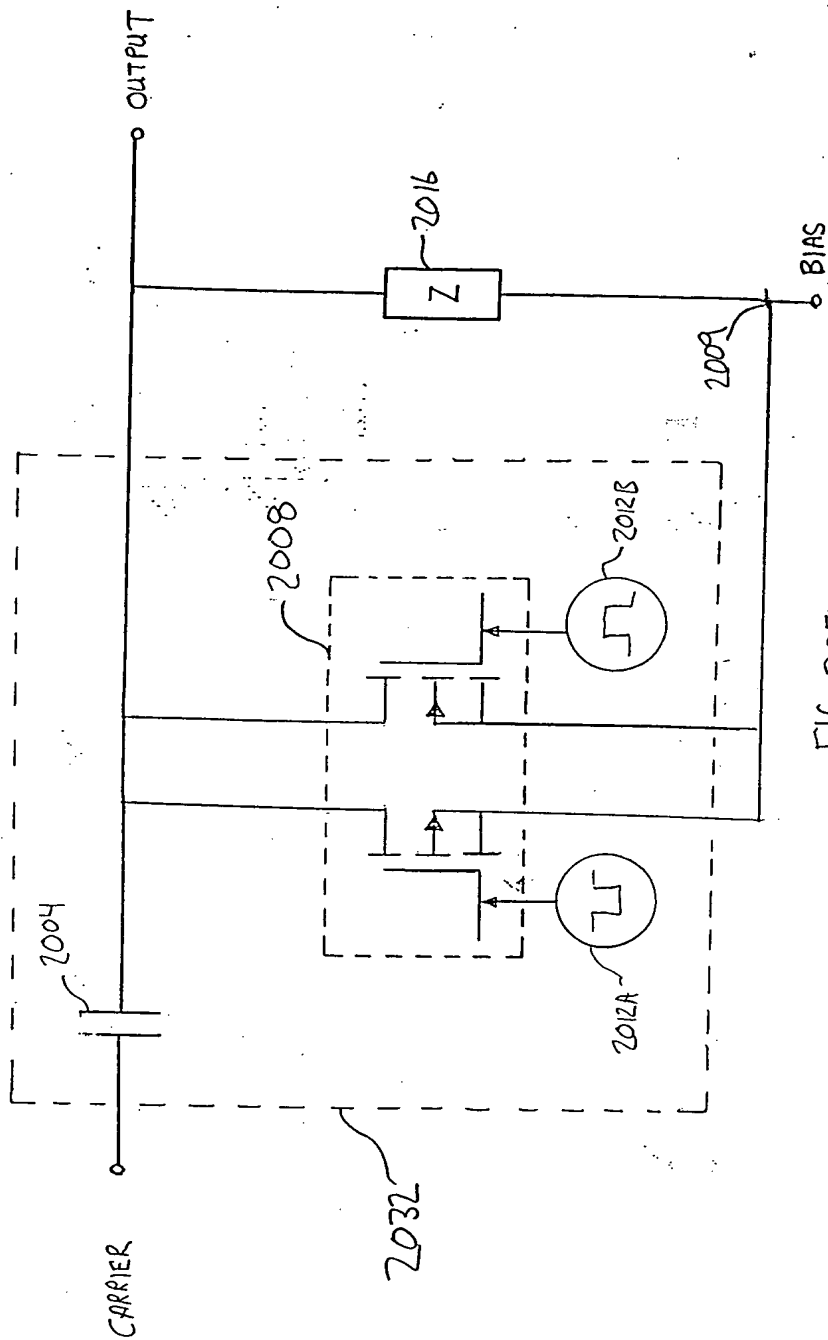


FIG. 20E

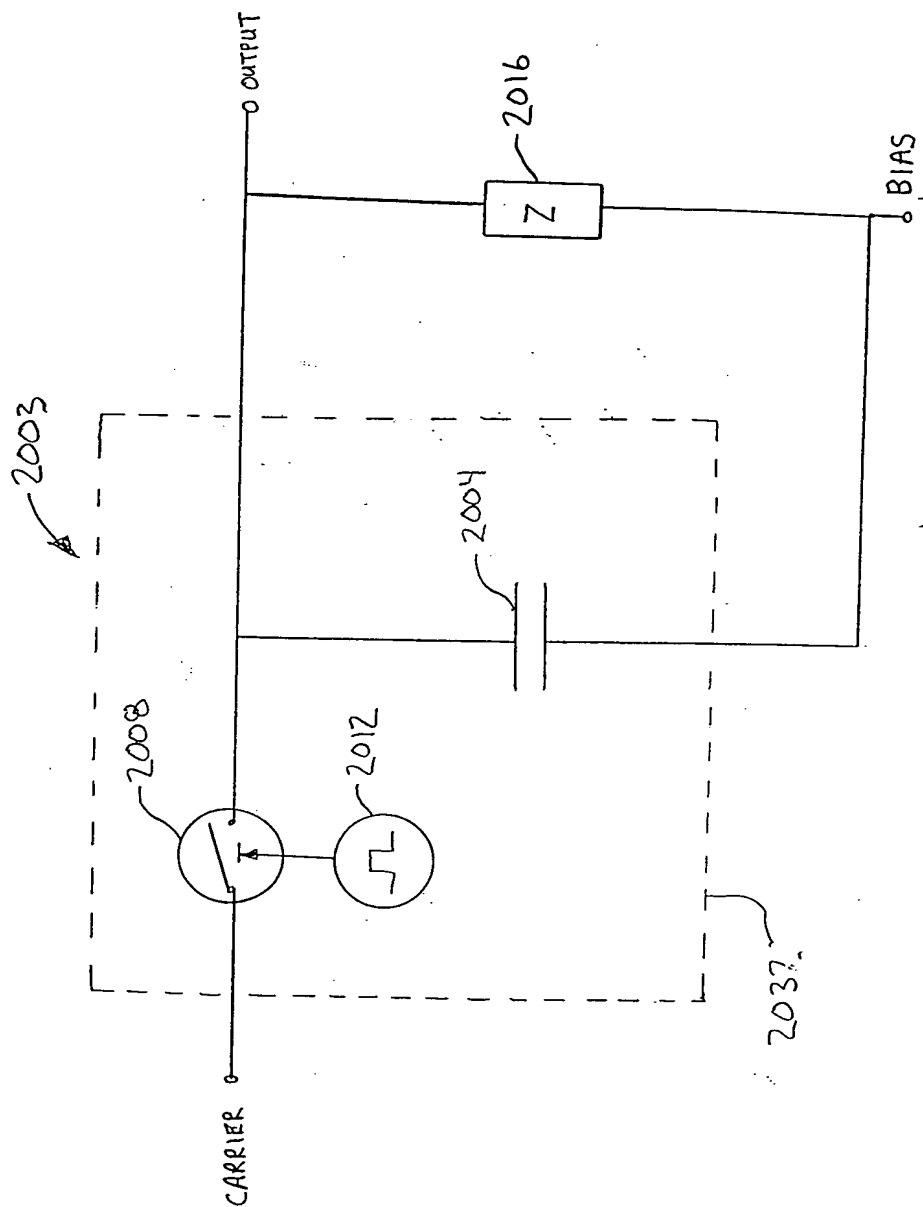


FIG. 20F

2101

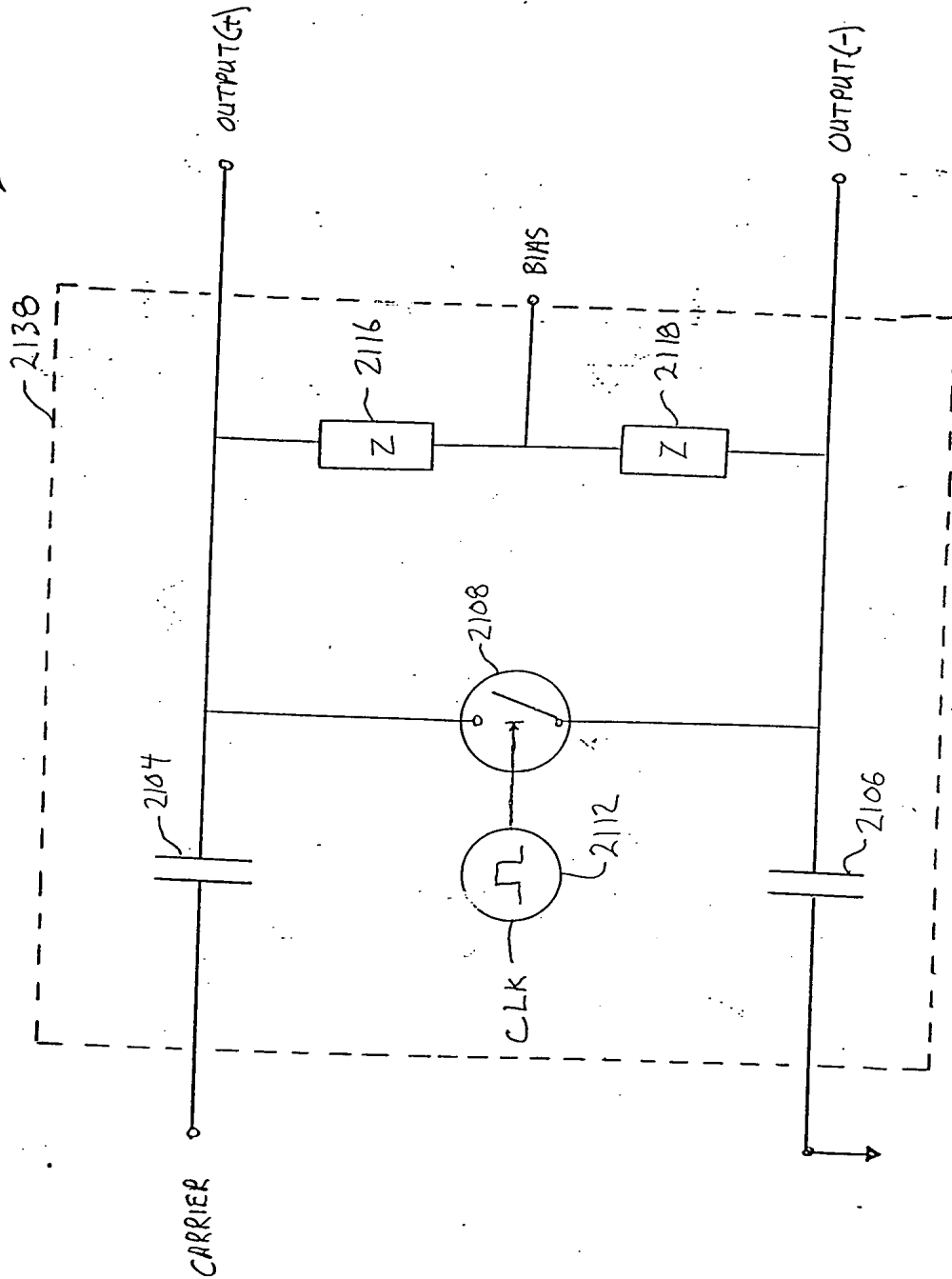


FIG. 21

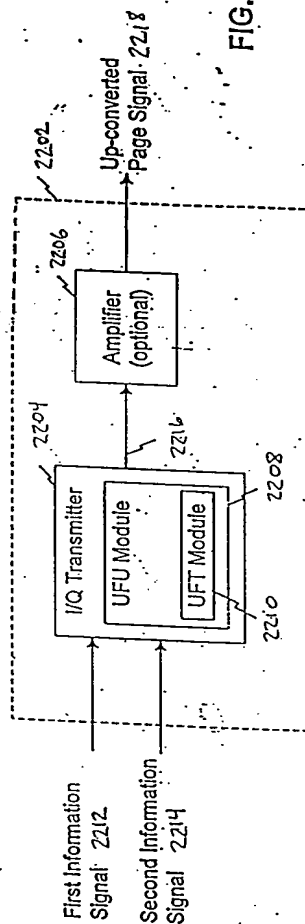


FIG. 22

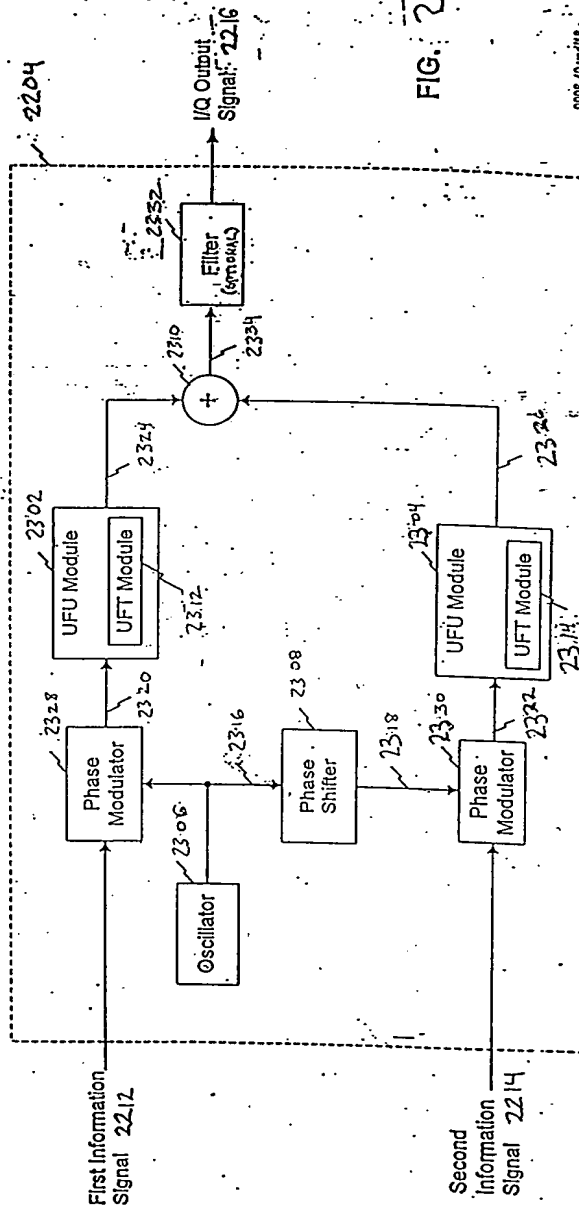
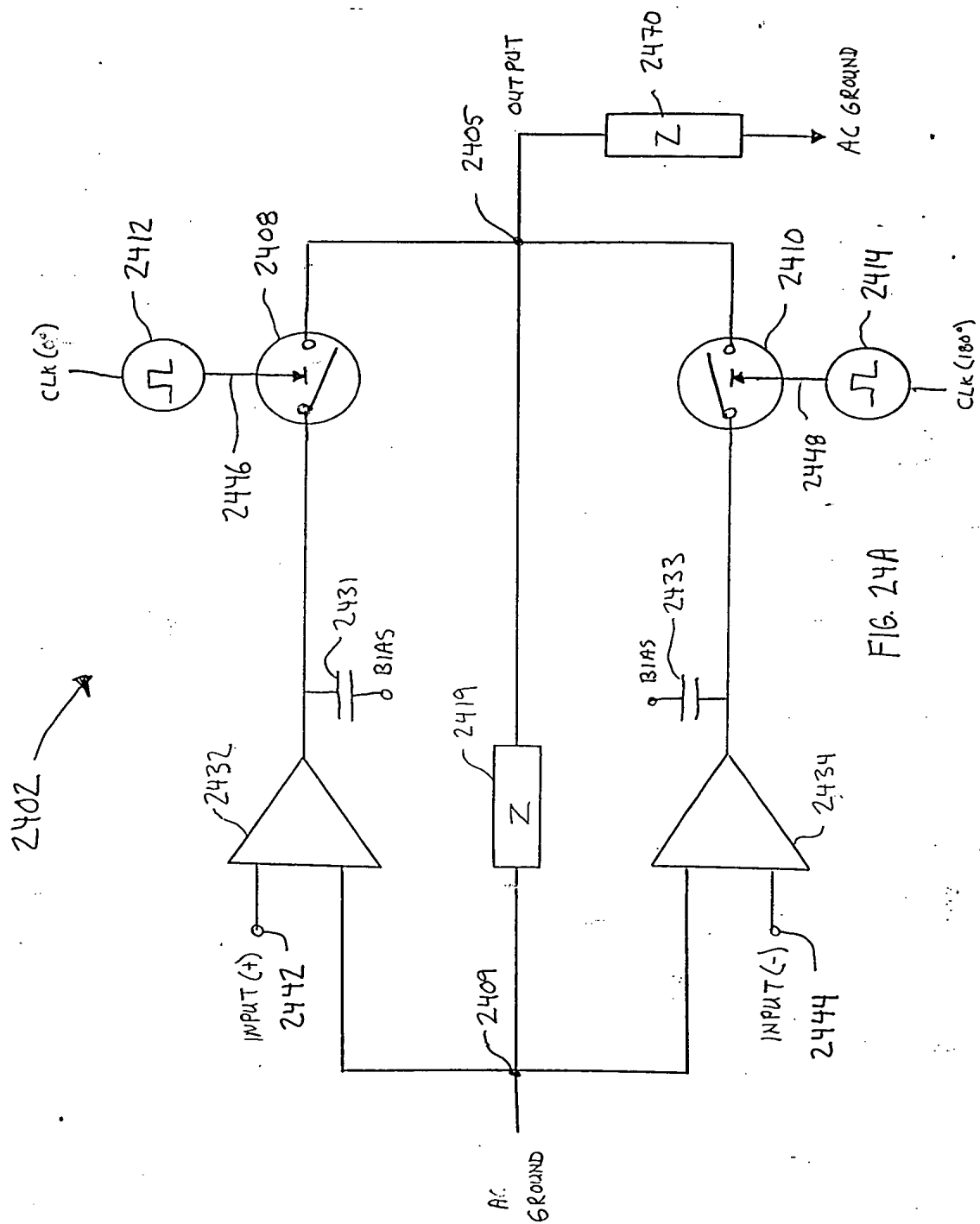
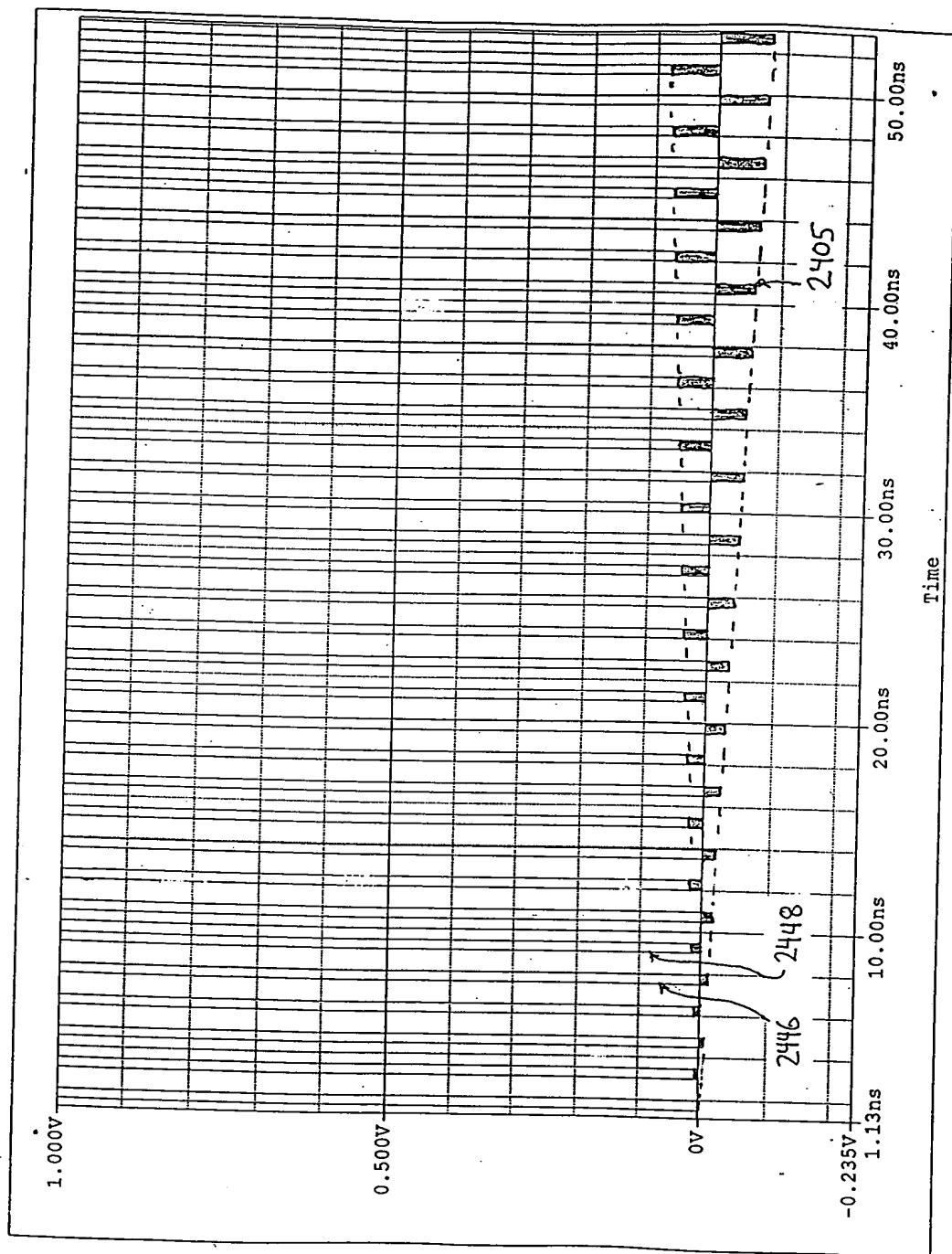


FIG. 23



TOP SECRET



F16.24B

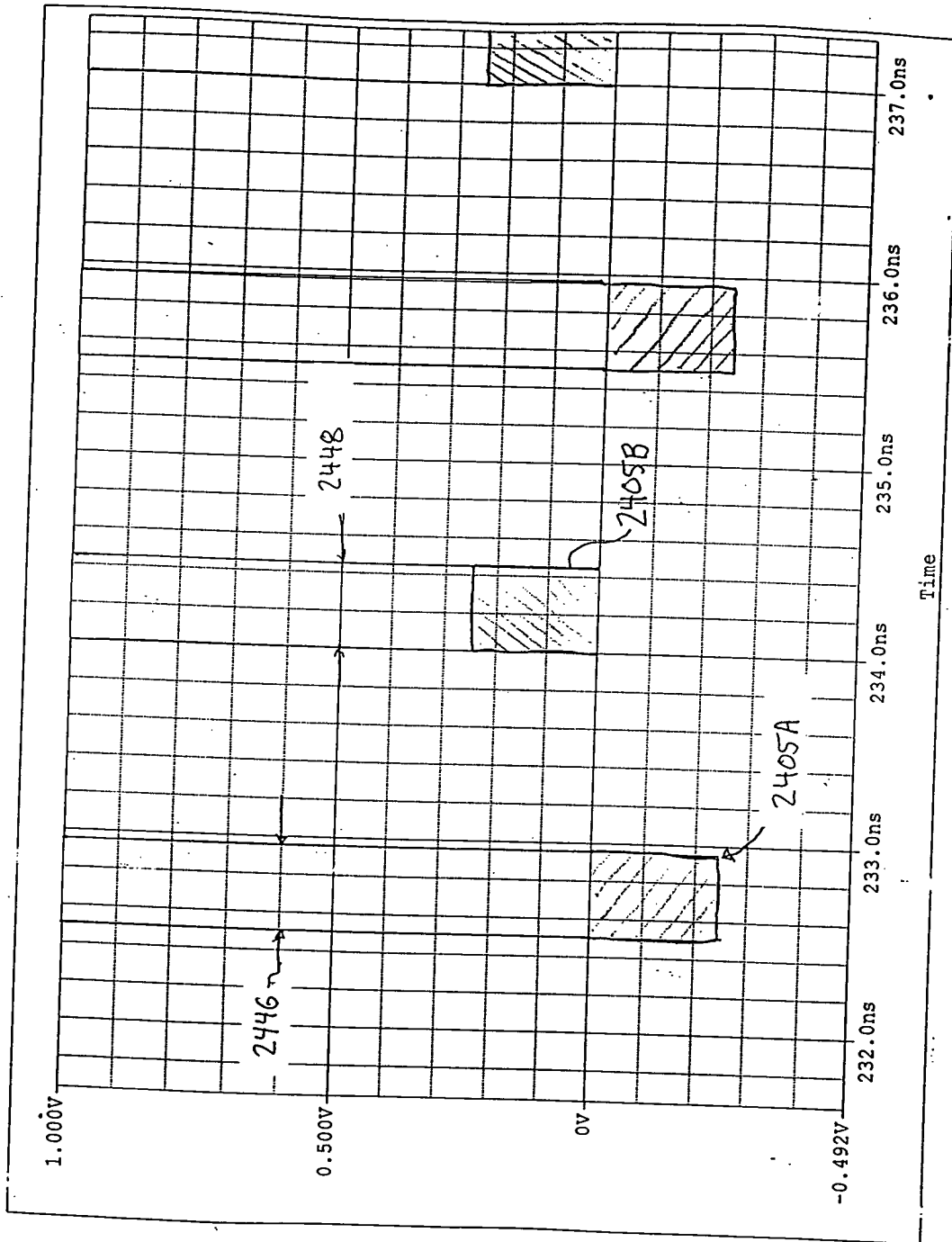


FIG. 24C

T09T50" T5855860

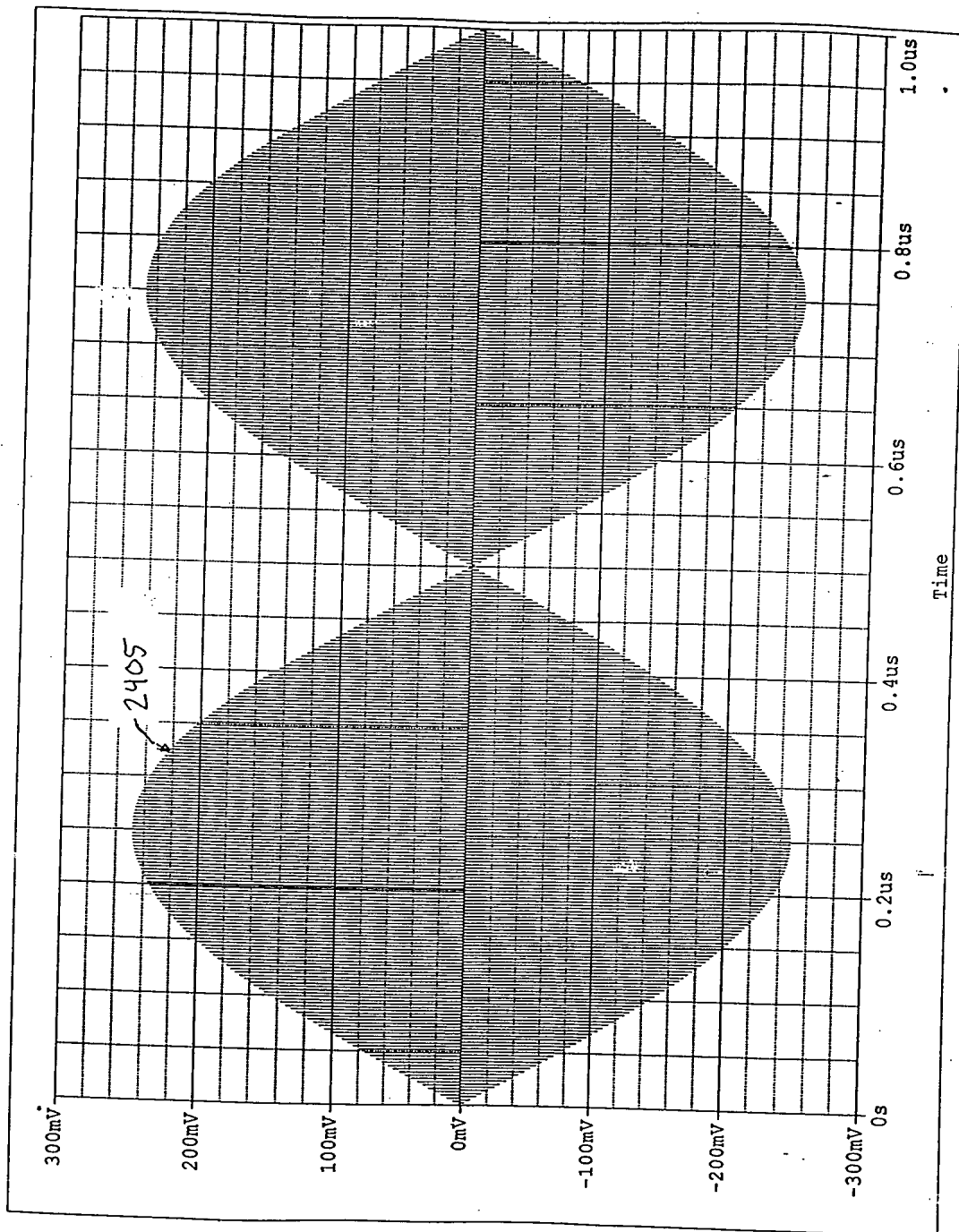


FIG. 240

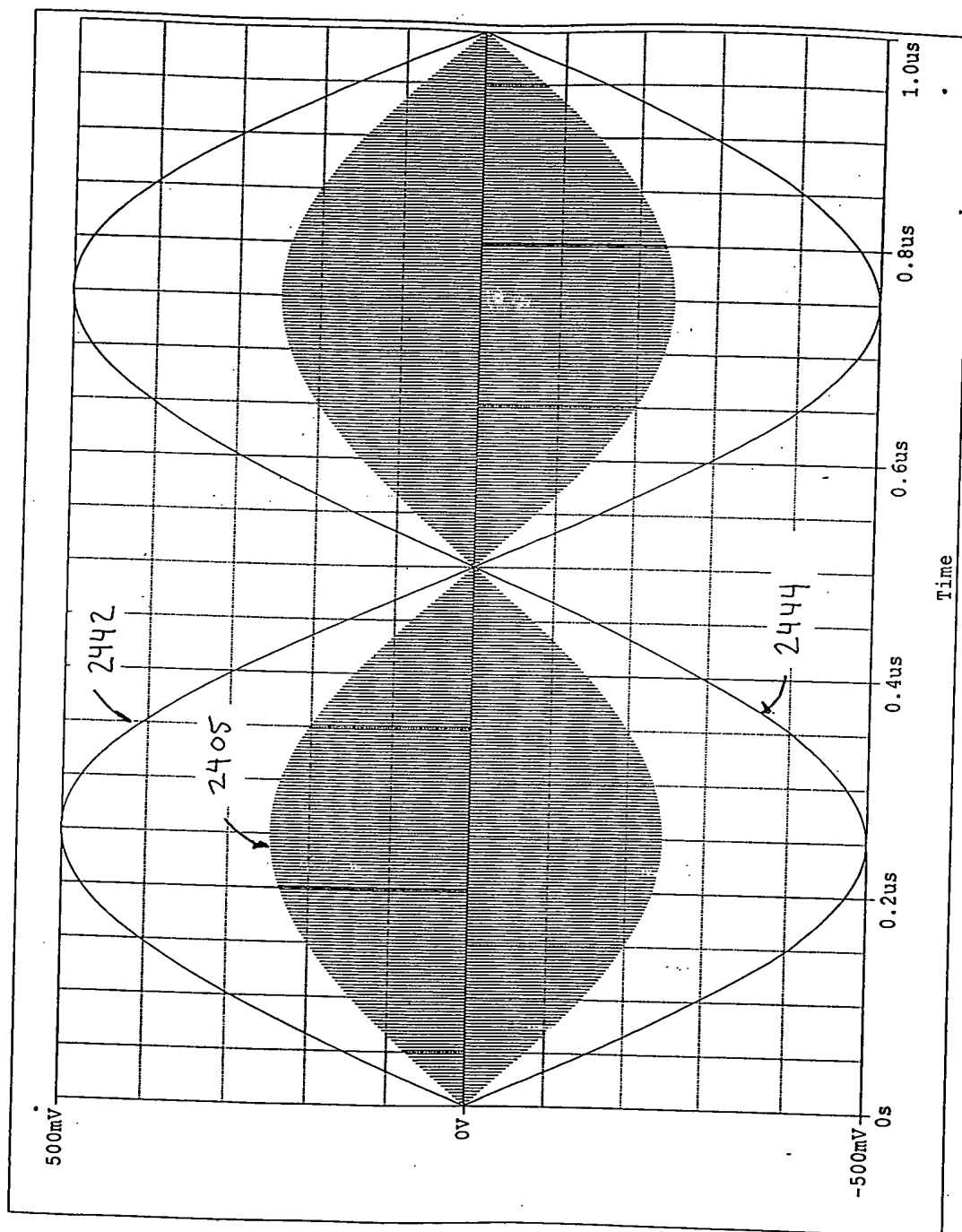


FIG. 24E

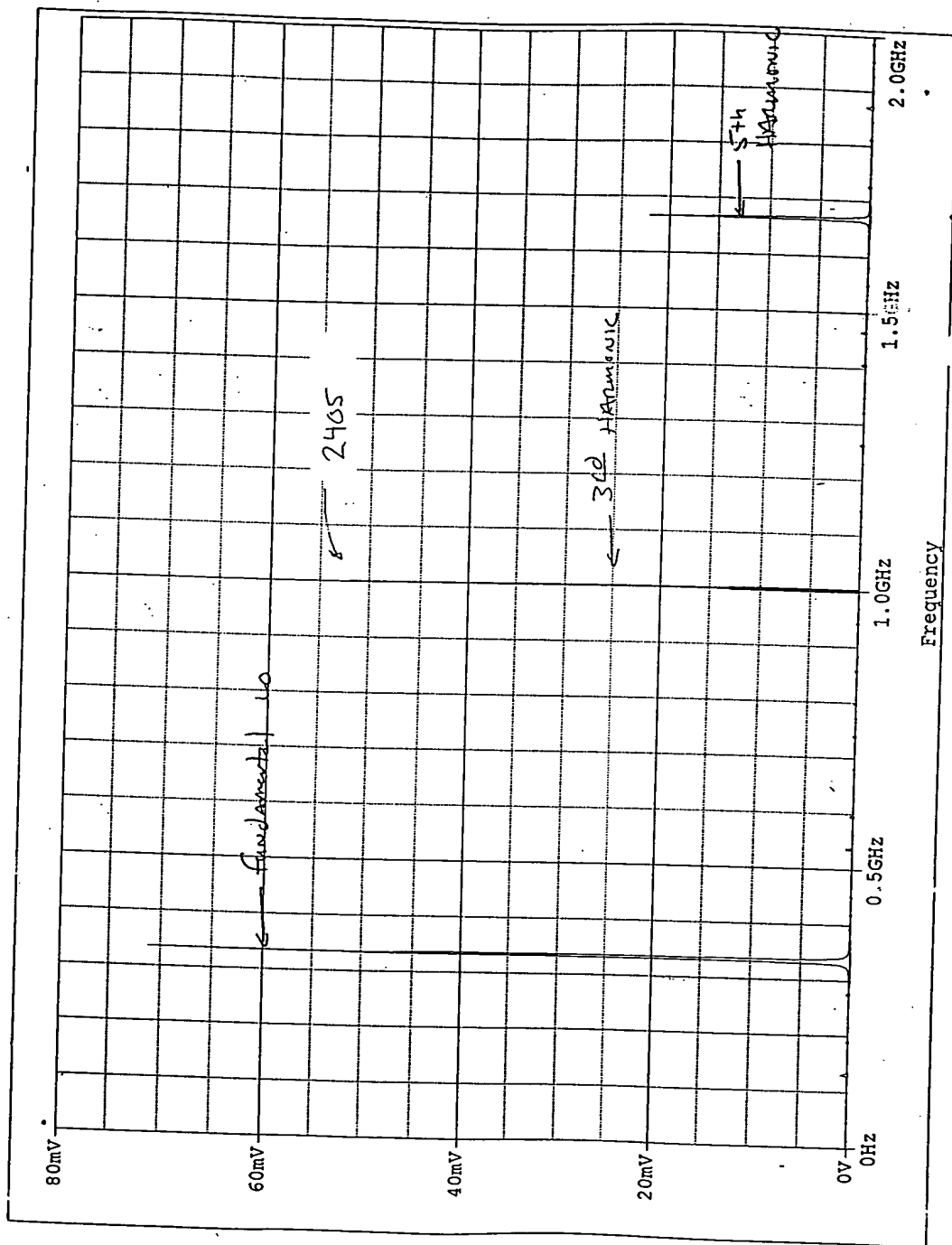


FIG. 24 F

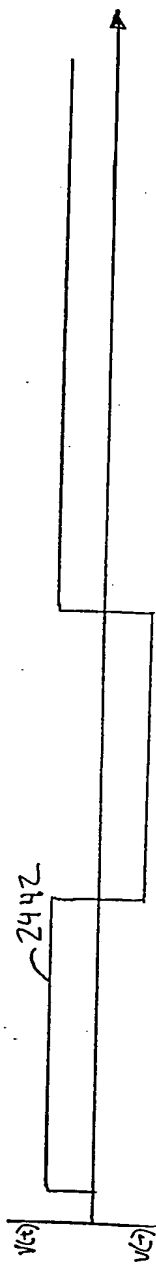


FIG. 24 G

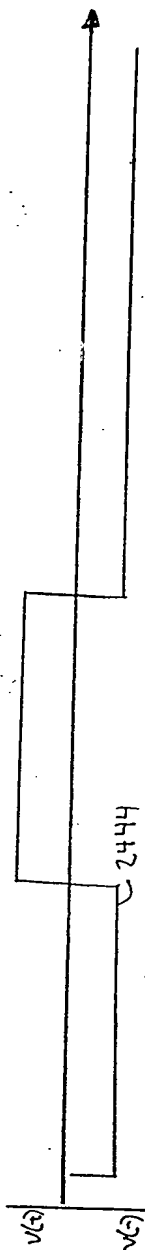


FIG. 24 H

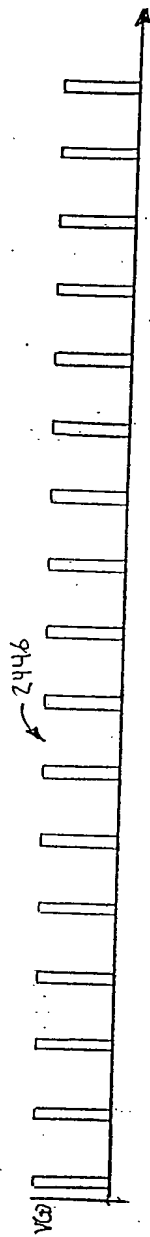


FIG. 24 I

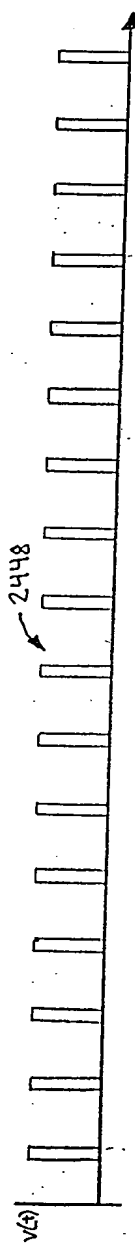


FIG. 24 J

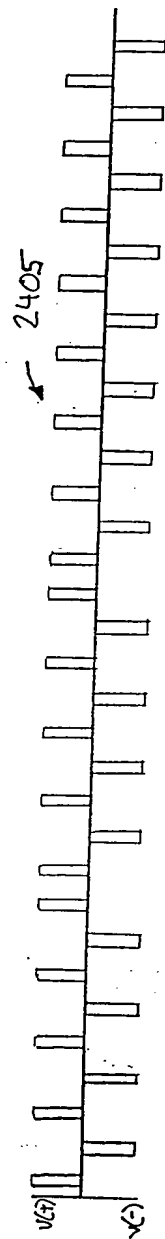


FIG. 24 K

2502

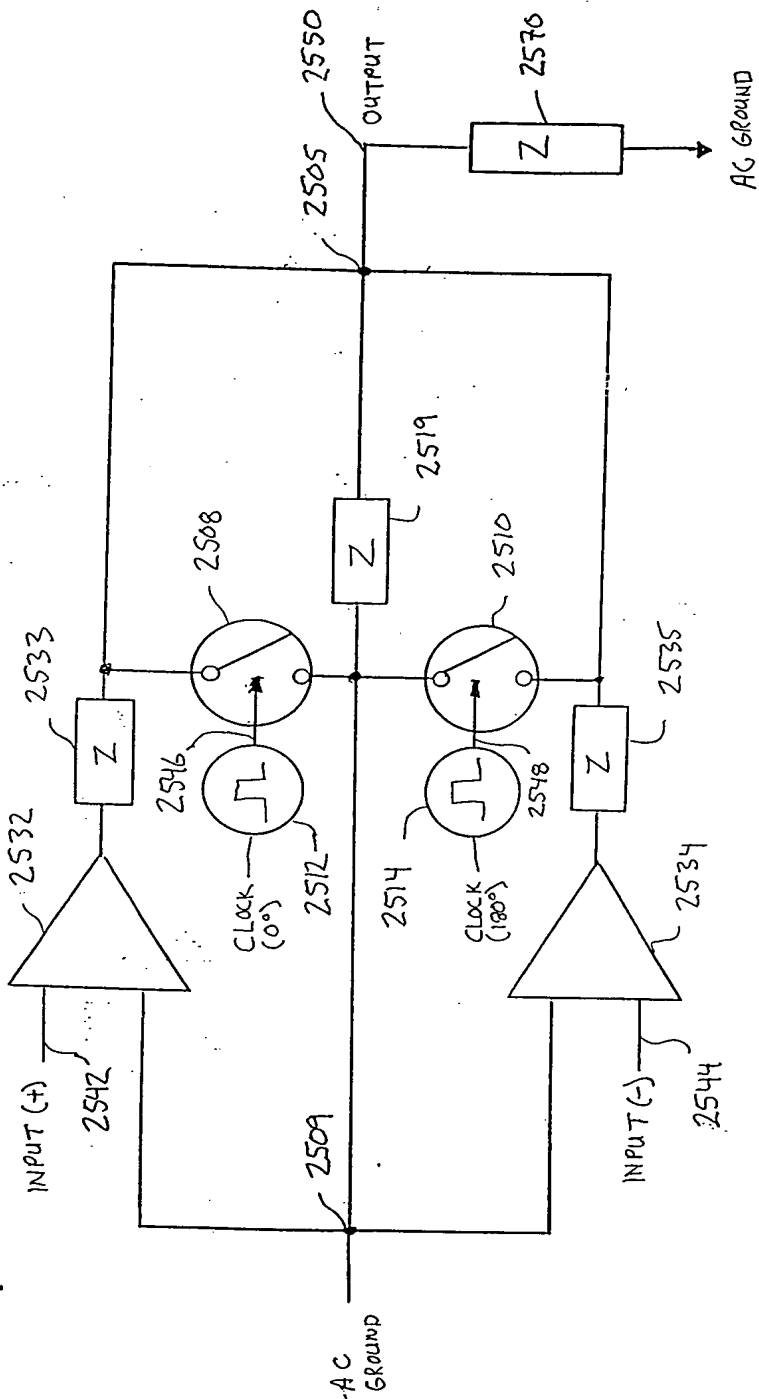


FIG. 25A

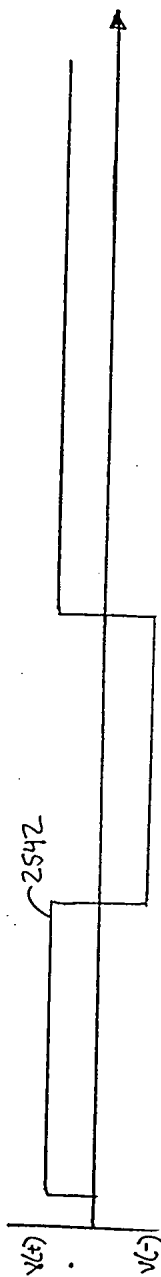


FIG. 25B

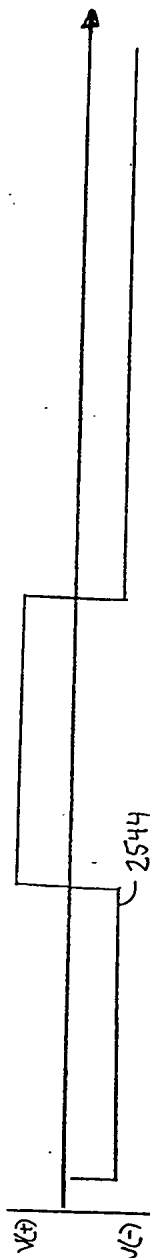


FIG. 25C

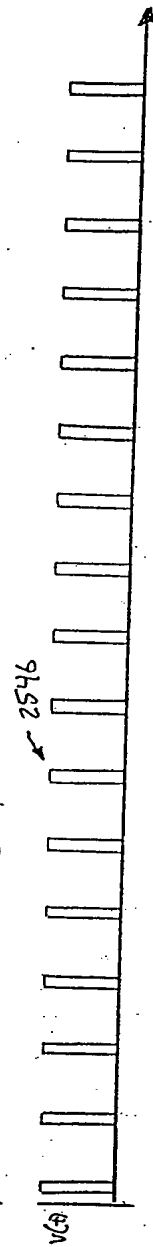


FIG. 25D

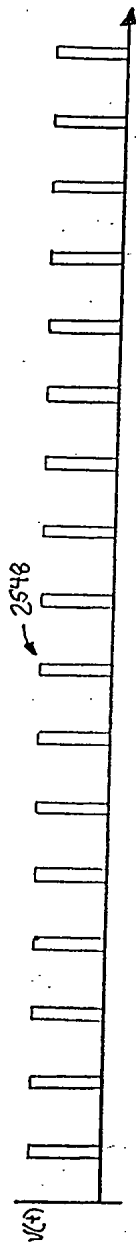


FIG. 25E

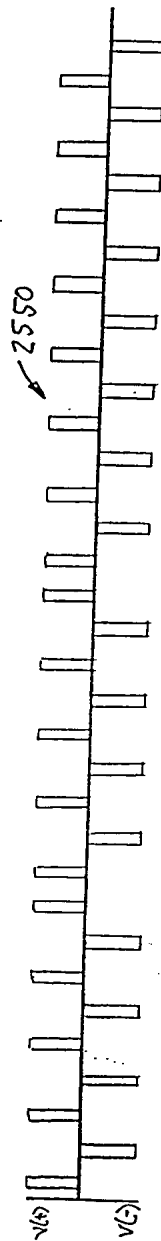


FIG. 25F

2602

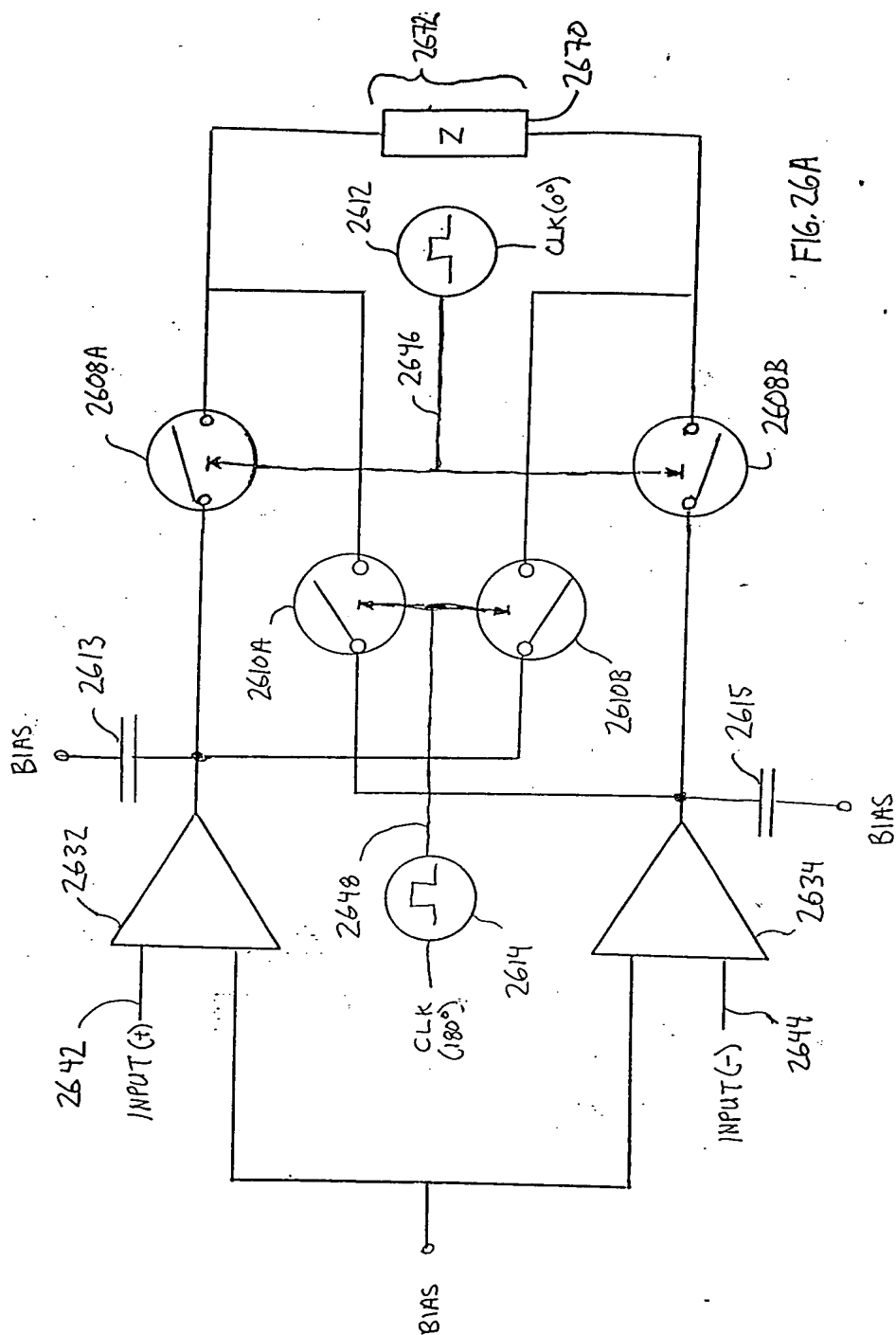


FIG. 26A

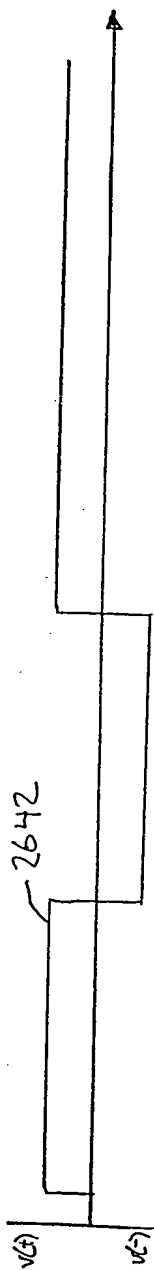


FIG. 26B

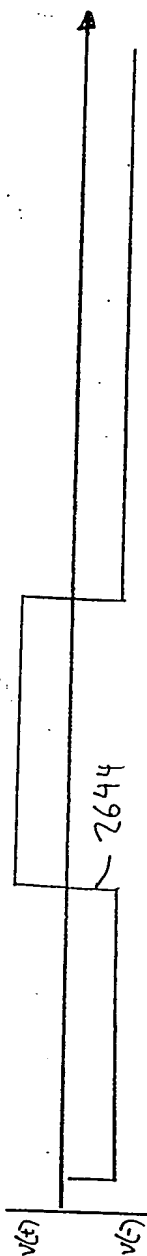


FIG. 26C

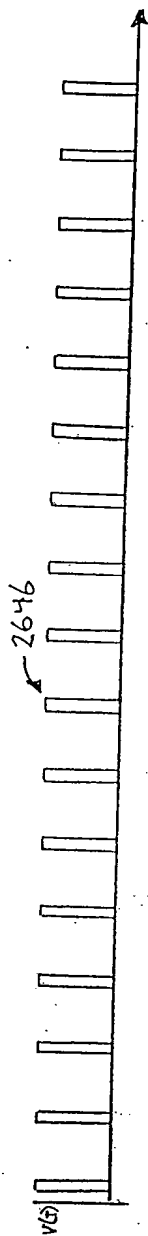


FIG. 26D

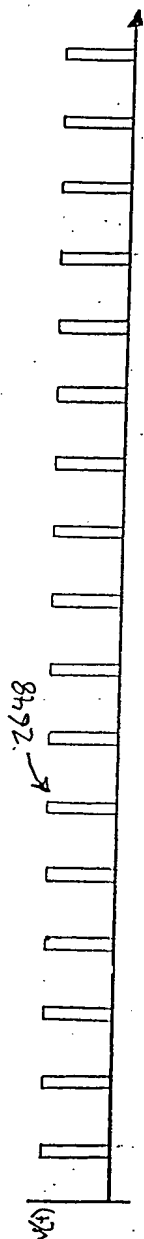


FIG. 26E

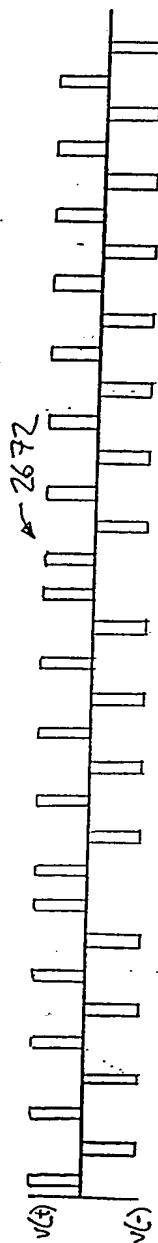


FIG. 26F

2702

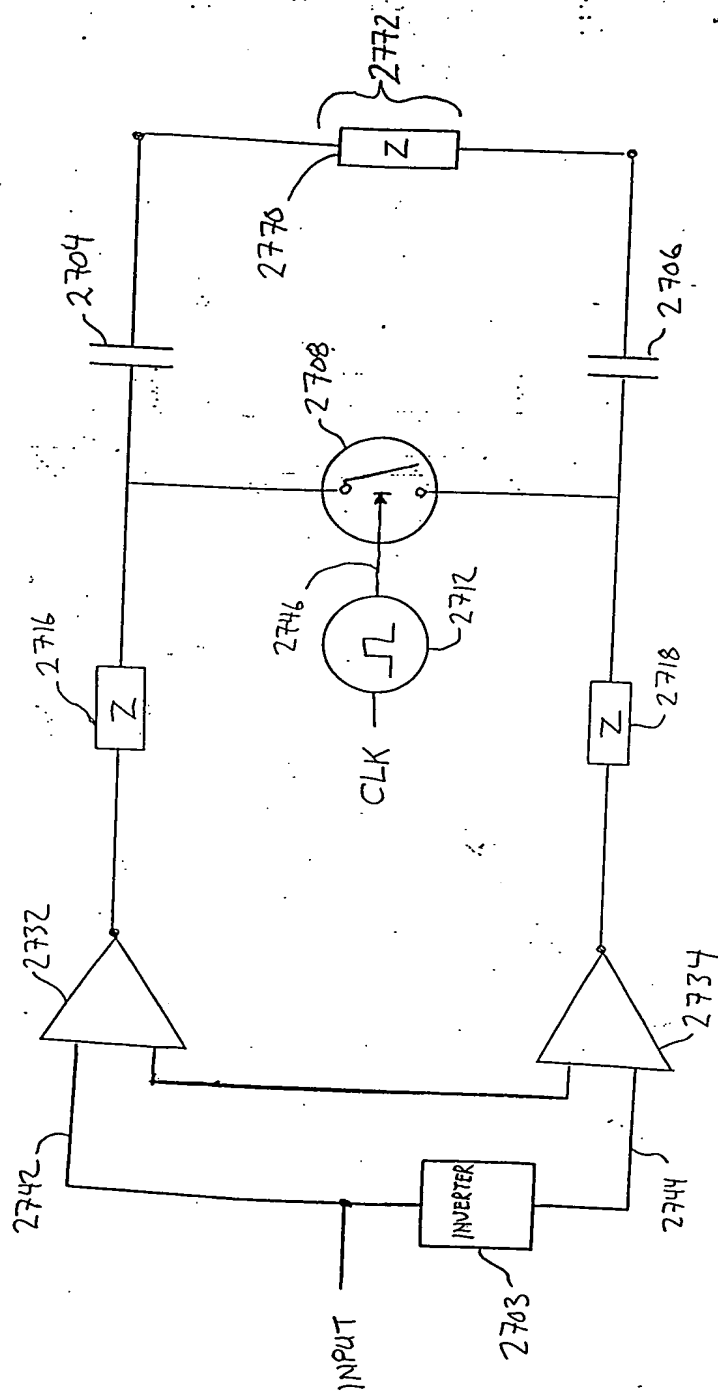
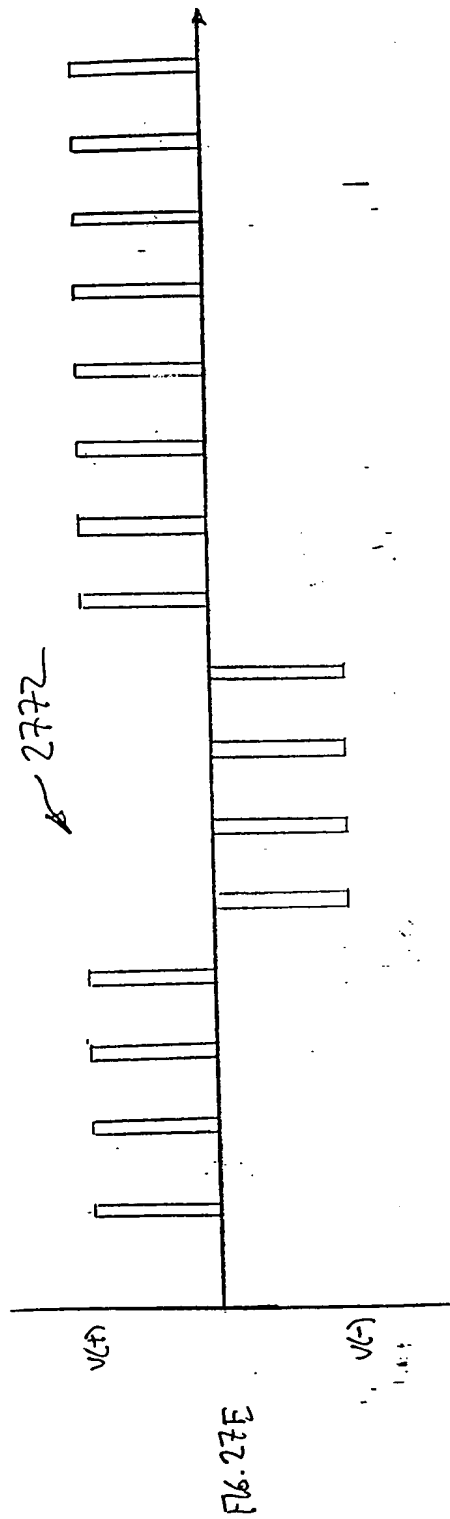
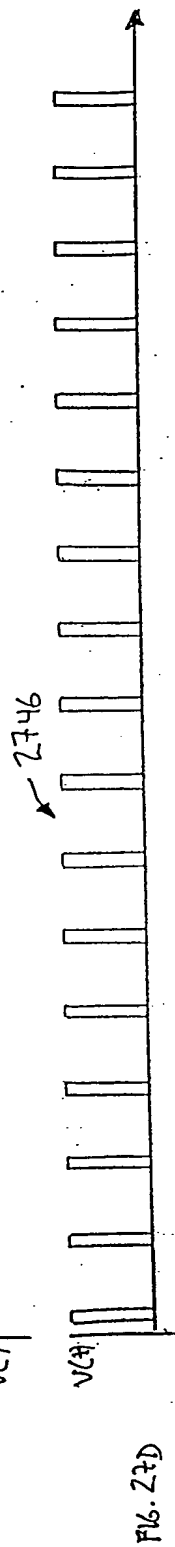
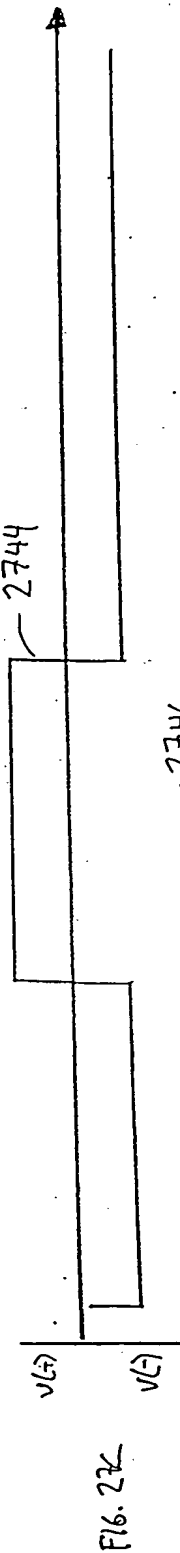
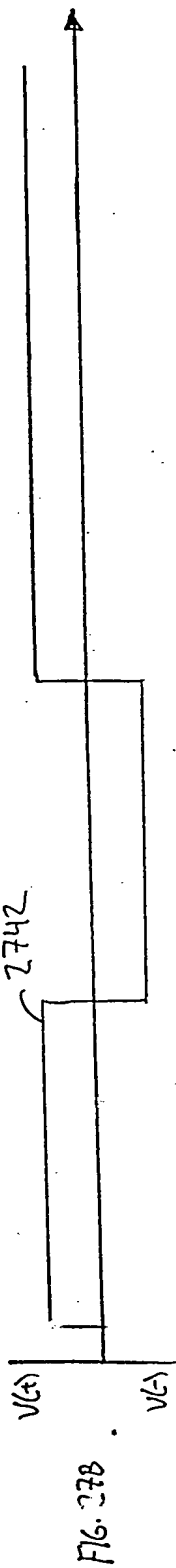


FIG. 27A



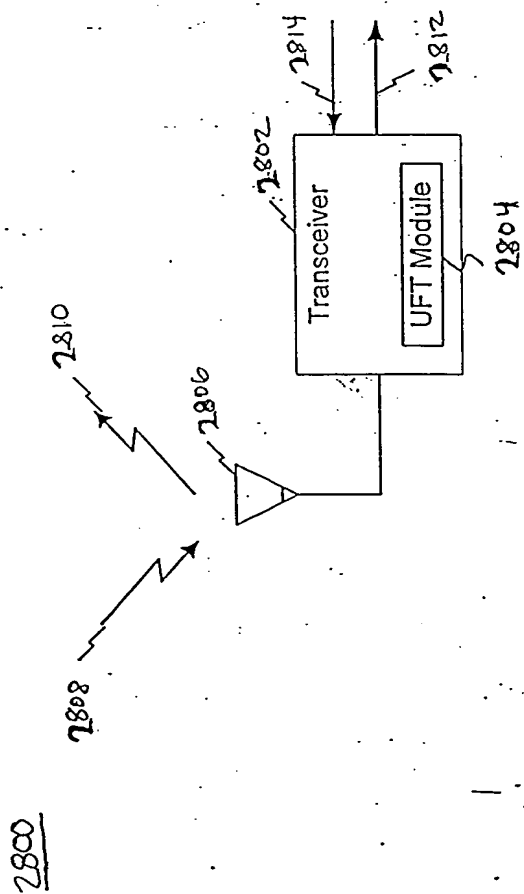
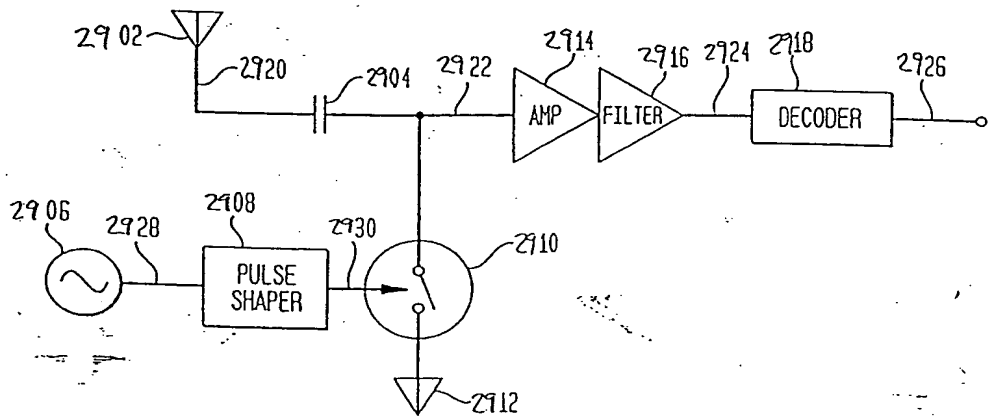


FIG. 28

FIG. 29
 EXEMPLARY RECEIVER FOR
 UNIVERSAL FREQUENCY DOWN-CONVERSION



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09855851.051604

FIG. 30

EXEMPLARY TRANSMITTER USING
THE PRESENT INVENTION

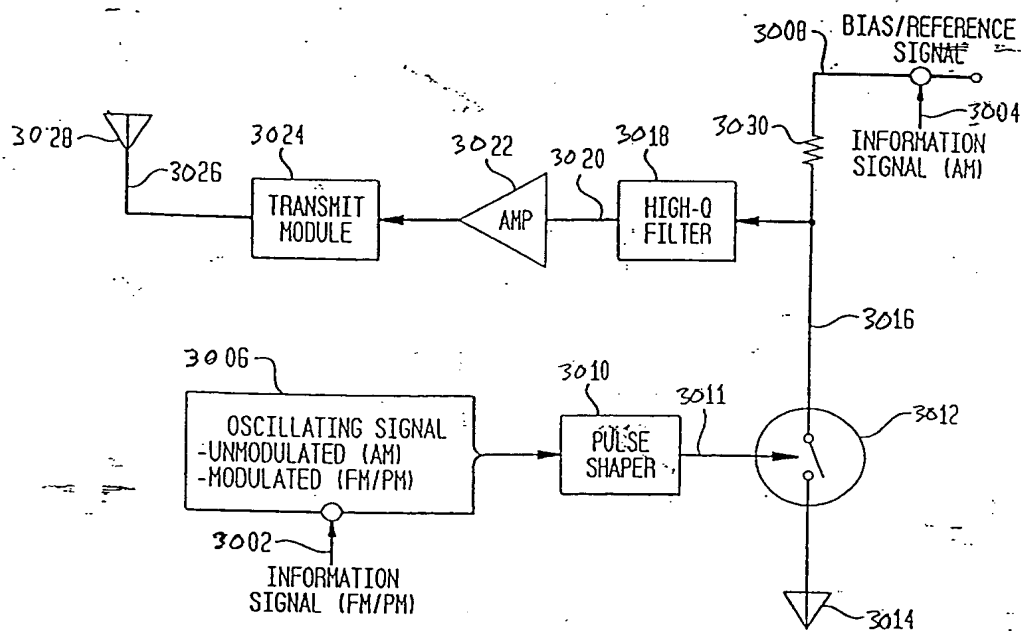
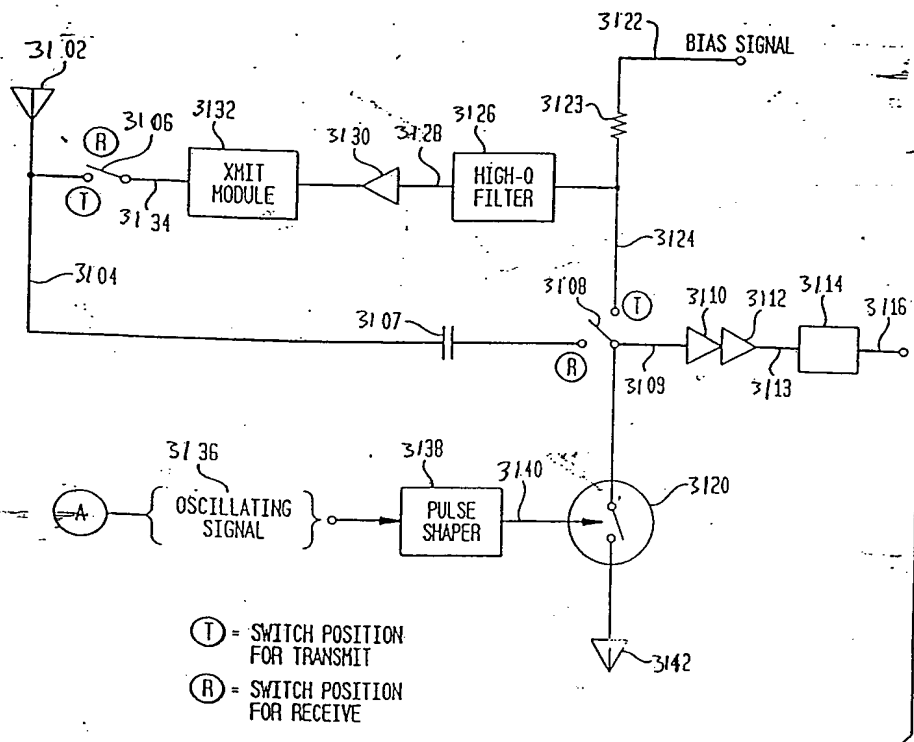


FIG. 31A

TRANSMITTER USING PRESENT INVENTION IN A
HALF DUPLEX COMMUNICATIONS CIRCUIT WITH A
UNIVERSAL FREQUENCY DOWN-CONVERTER (FH & PH)



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FIG. 31B

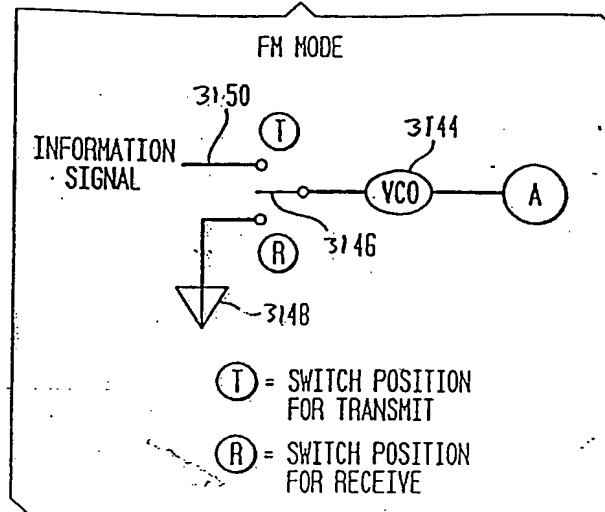


FIG. 31C

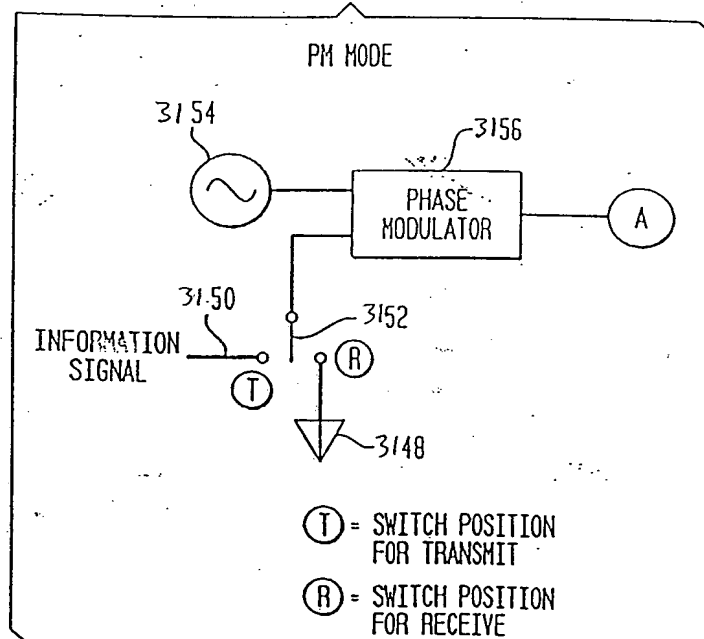
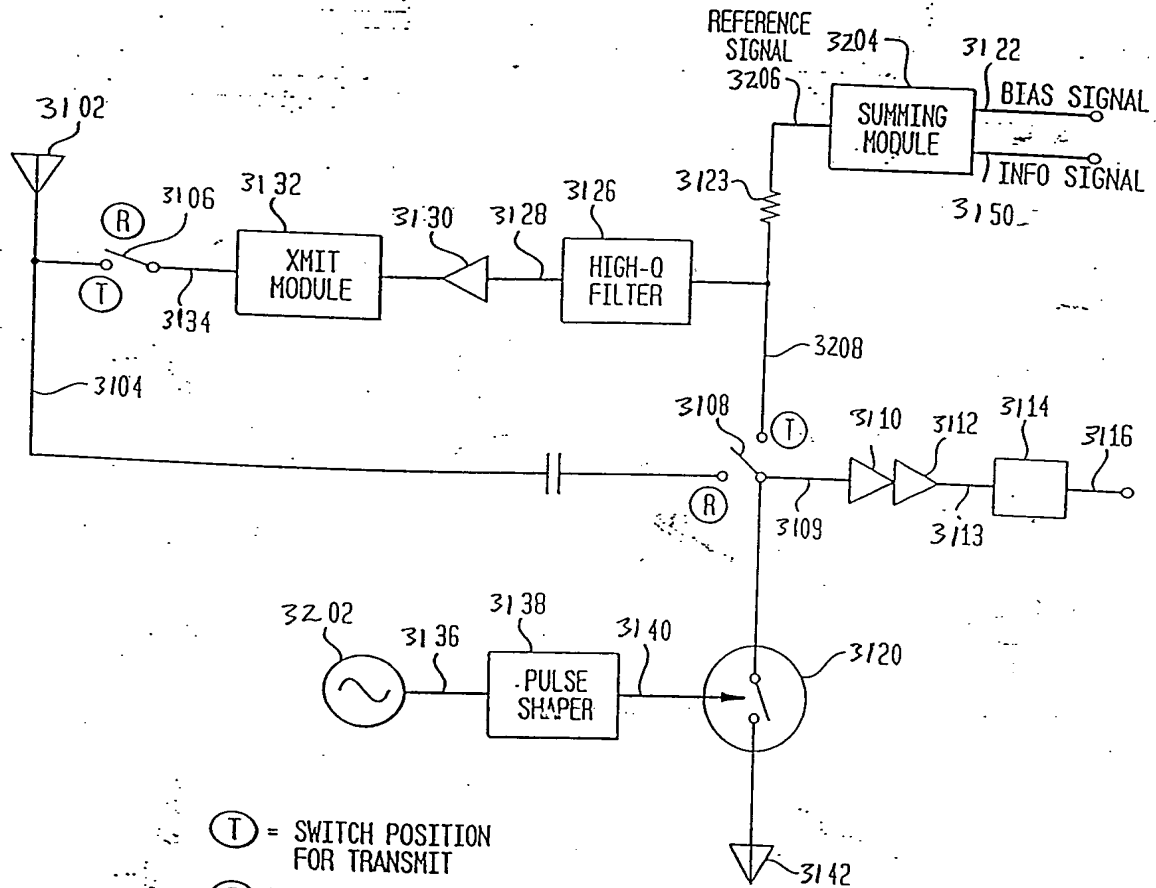


FIG. 32

TRANSMITTER USING PRESENT INVENTION IN
A HALF-DUPLEX COMMUNICATIONS CIRCUIT
WITH A UNIVERSAL FREQUENCY DOWN-CONVERTER (AM)



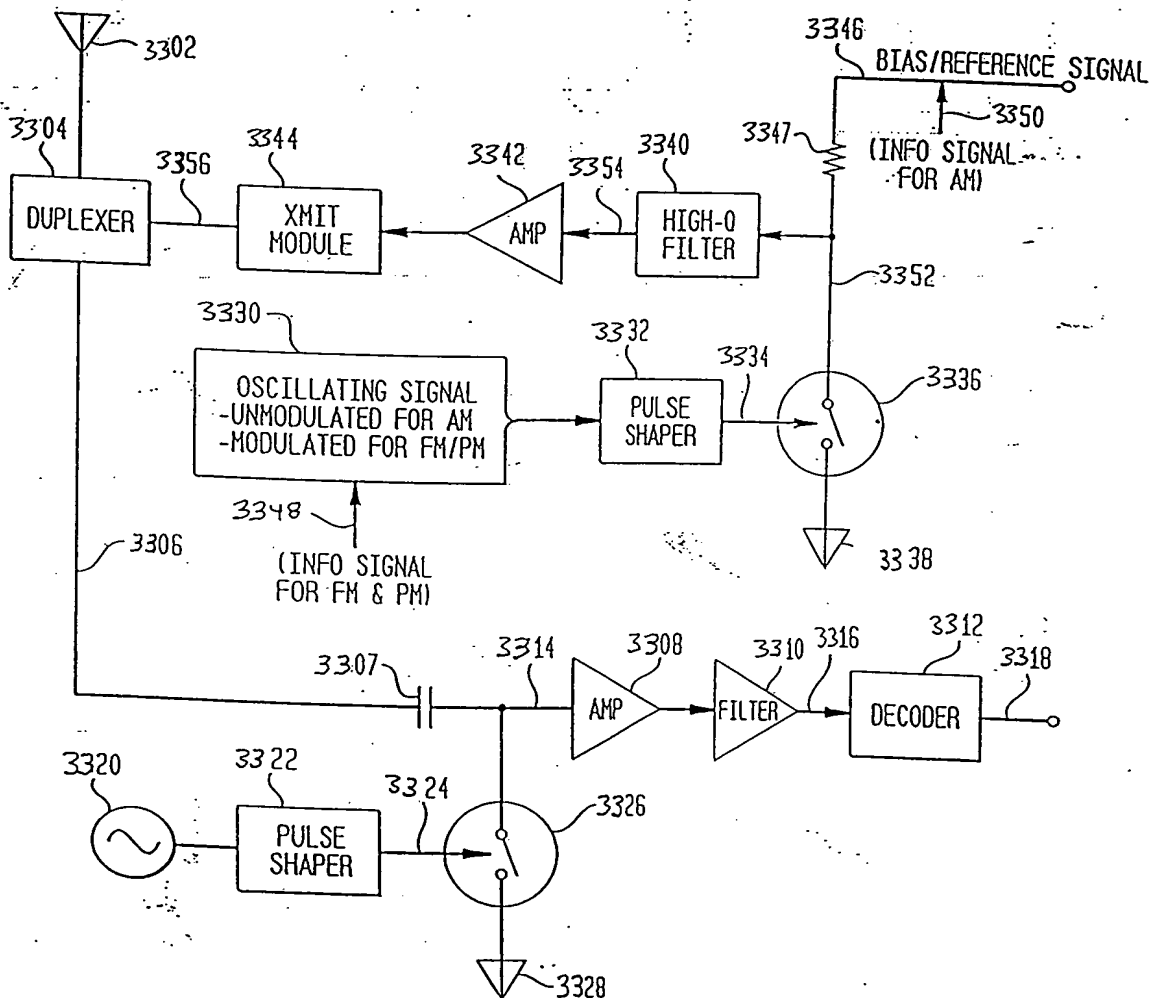
(T) = SWITCH POSITION
FOR TRANSMIT
(R) = SWITCH POSITION
FOR RECEIVE

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09355851.051604
T09T50" T855960

FIG. 33

TRANSMITTER USING PRESENT INVENTION IN
FULL DUPLEX COMMUNICATIONS CIRCUIT WITH
UNIVERSAL FREQUENCY DOWN-CONVERTER



3402

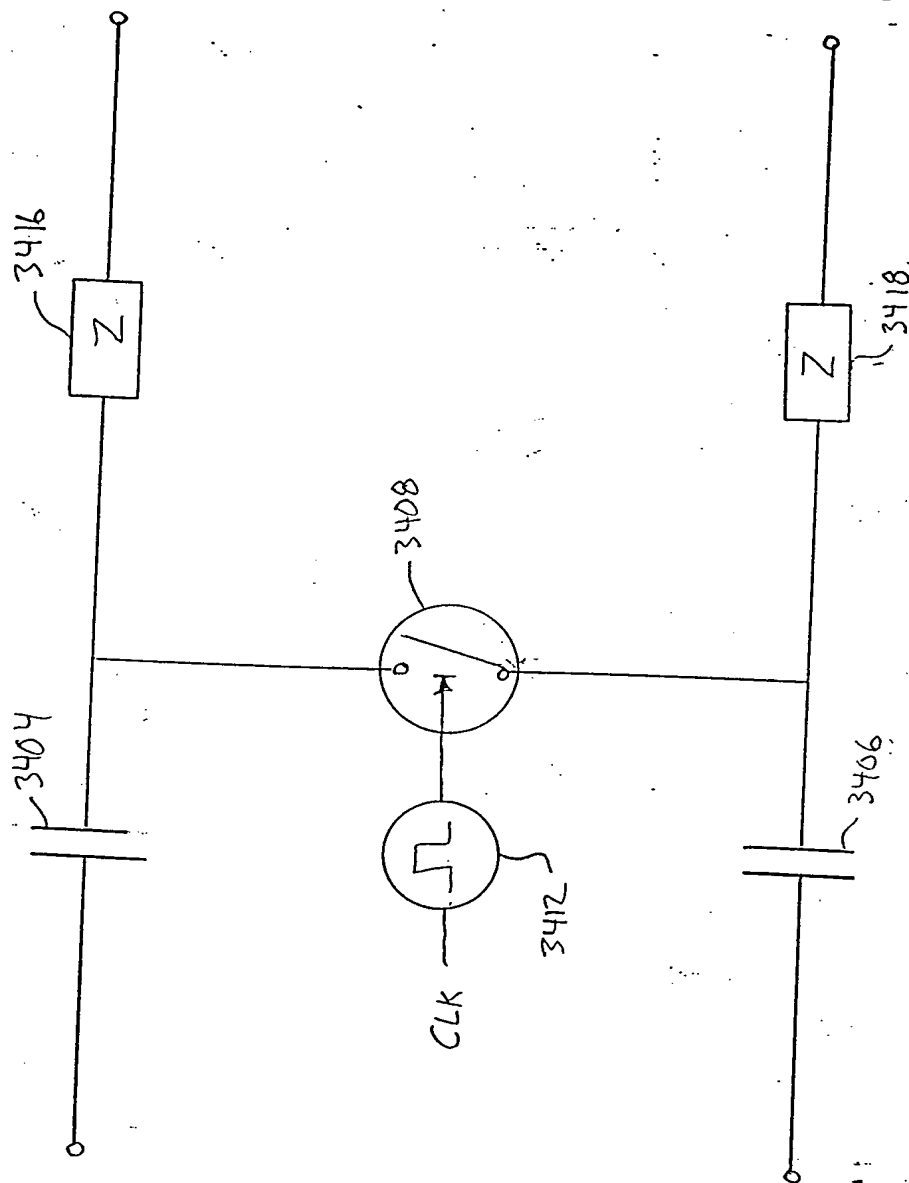


FIG. 34

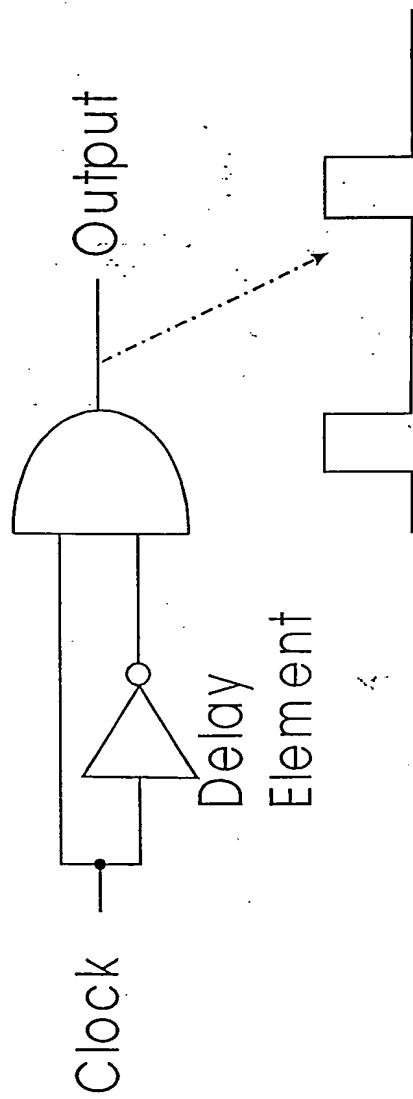
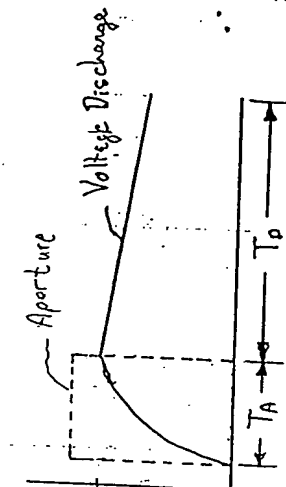
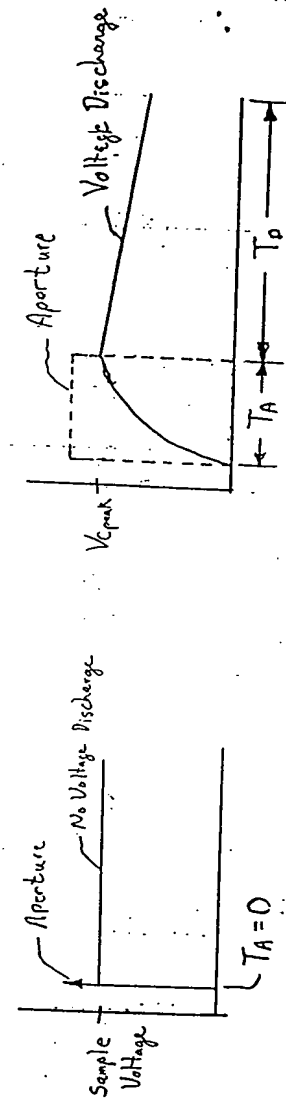
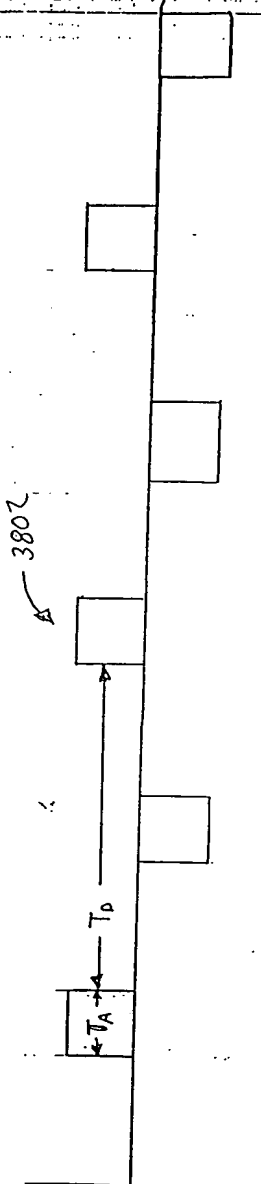
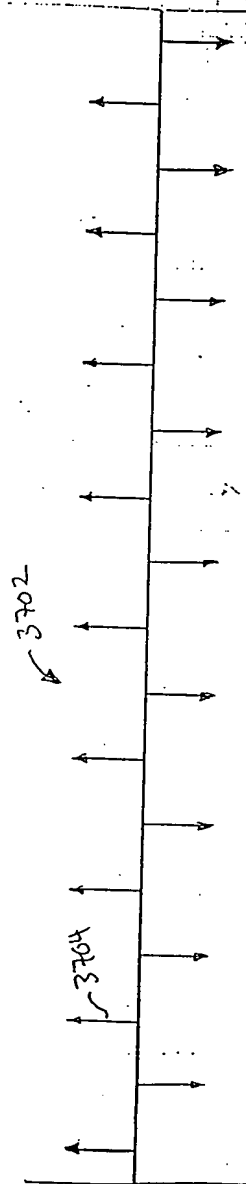
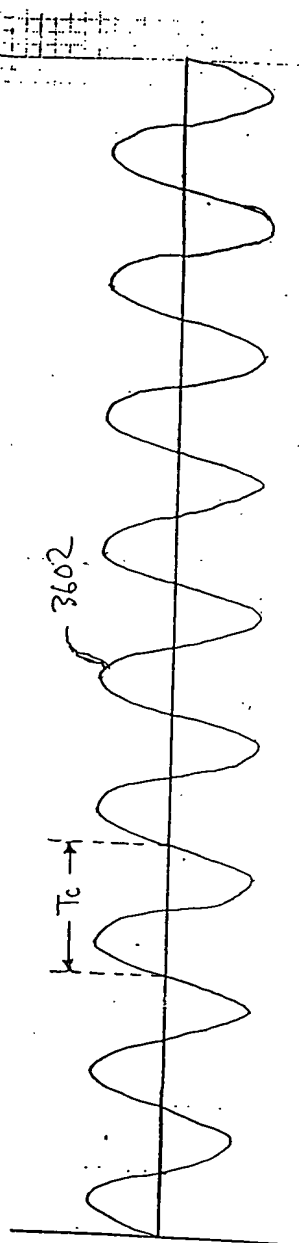


FIG. 35



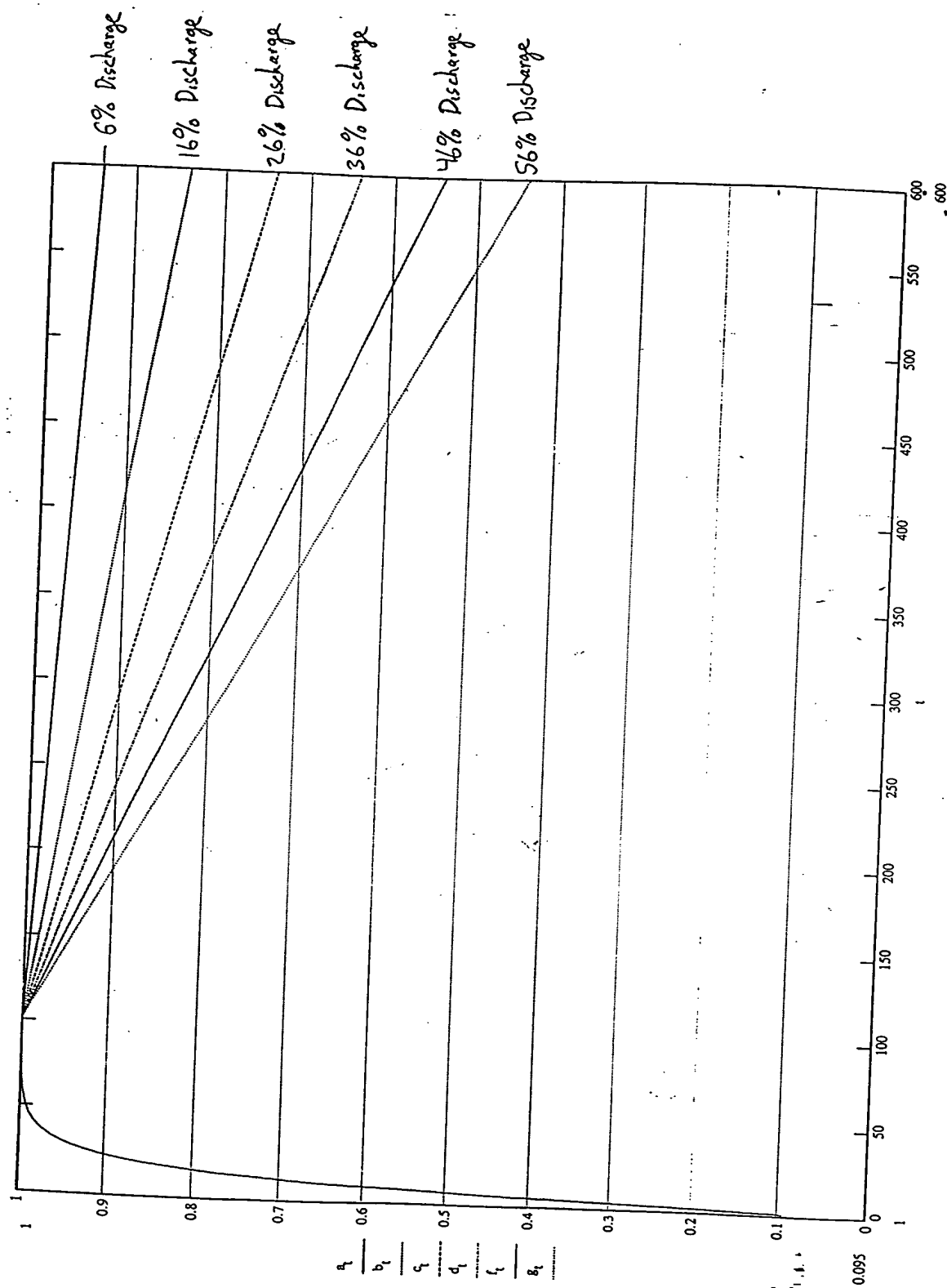


FIG. 41

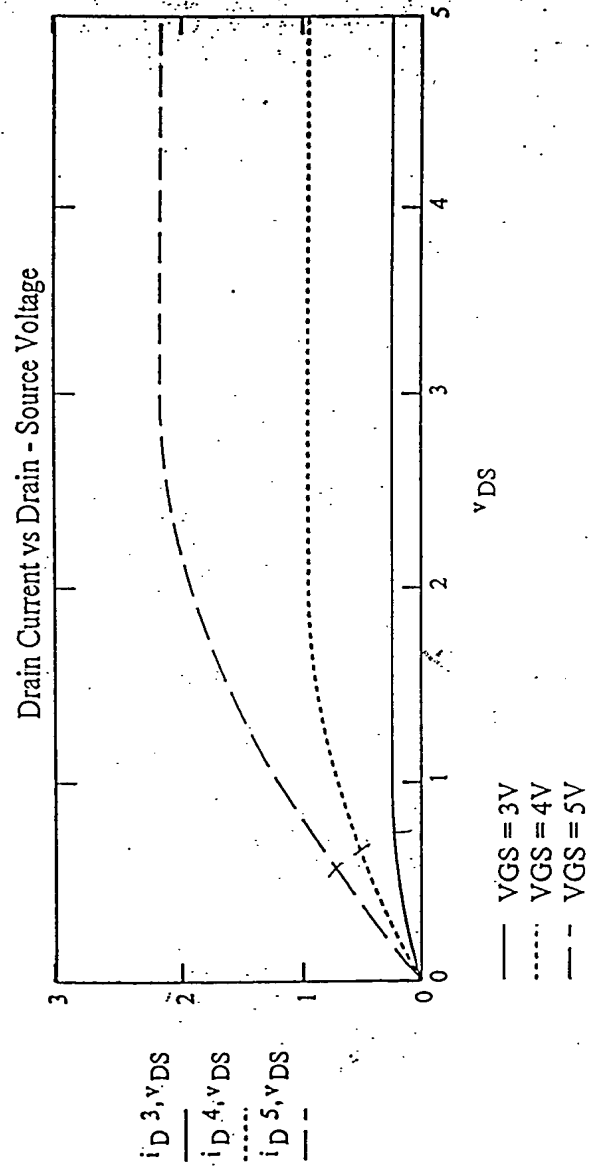


FIG 42

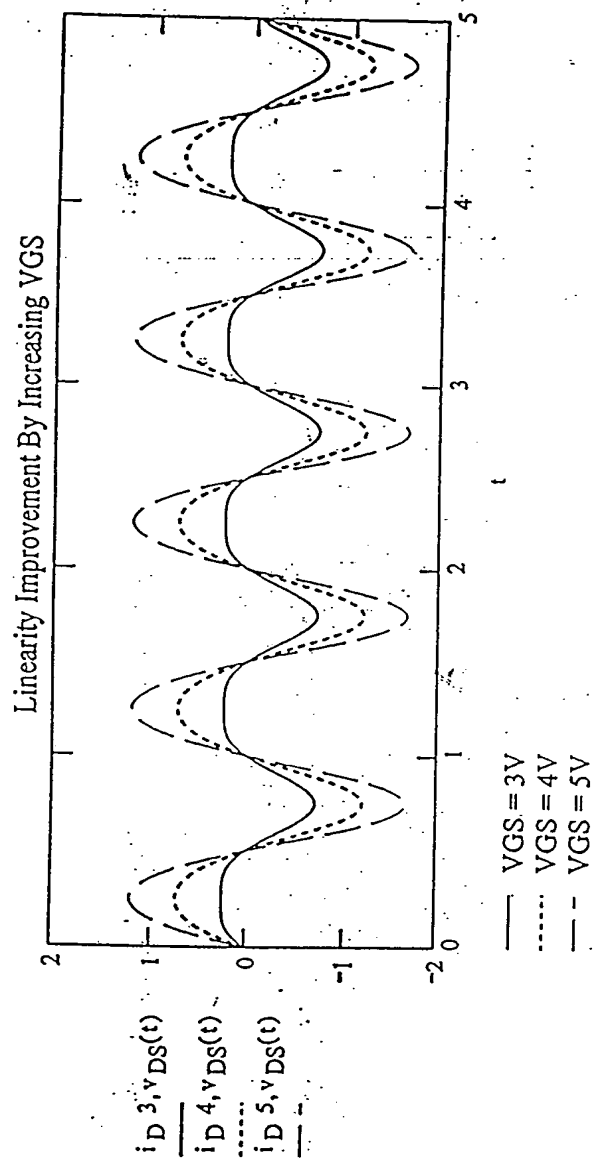
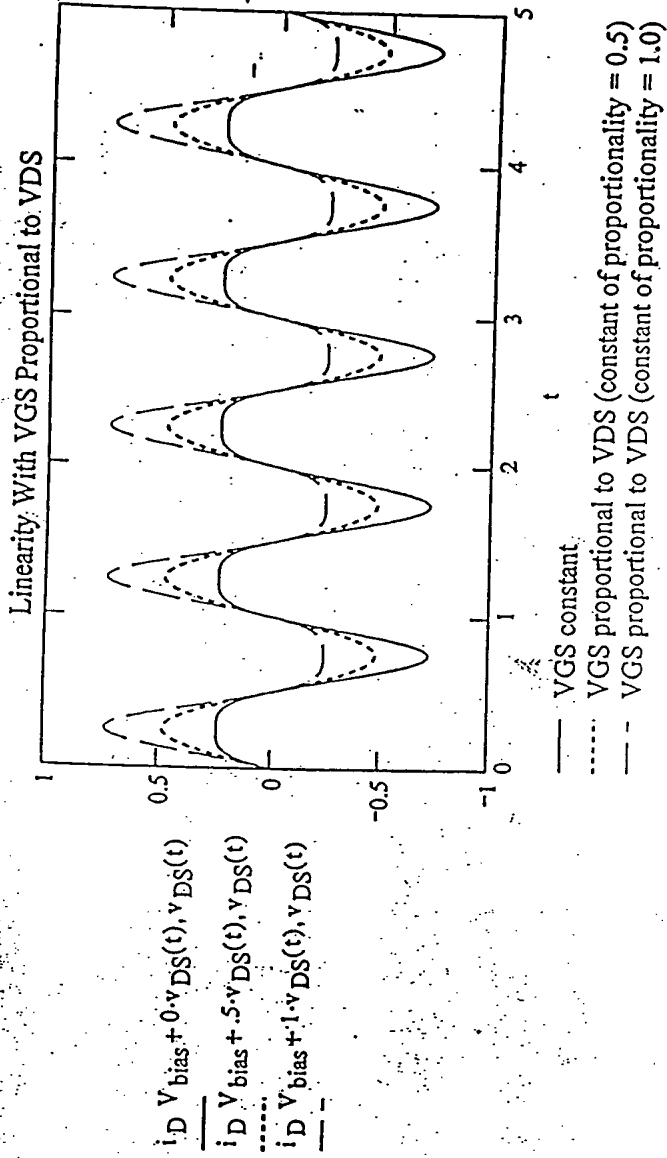


FIG. 43



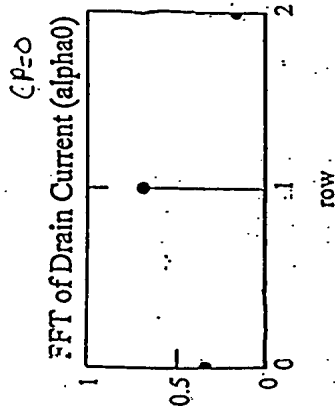


FIG. 45A

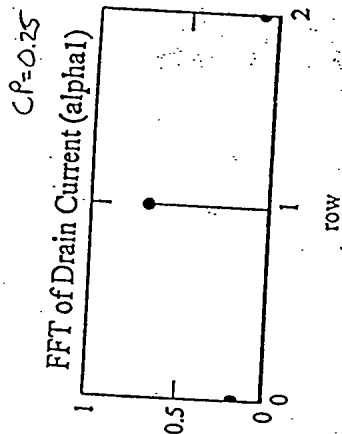


FIG. 45B

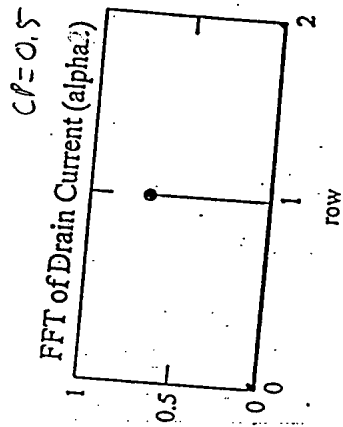


FIG. 45C

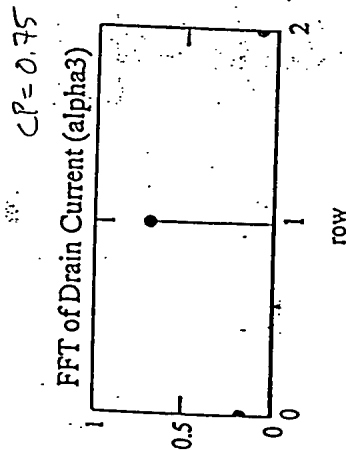


FIG. 45D

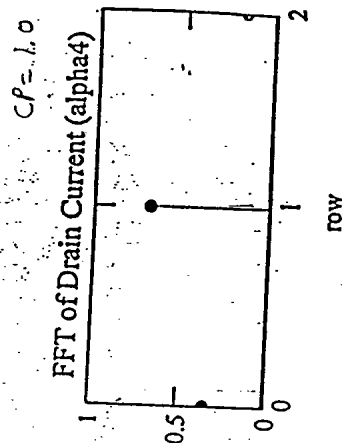


FIG. 45E

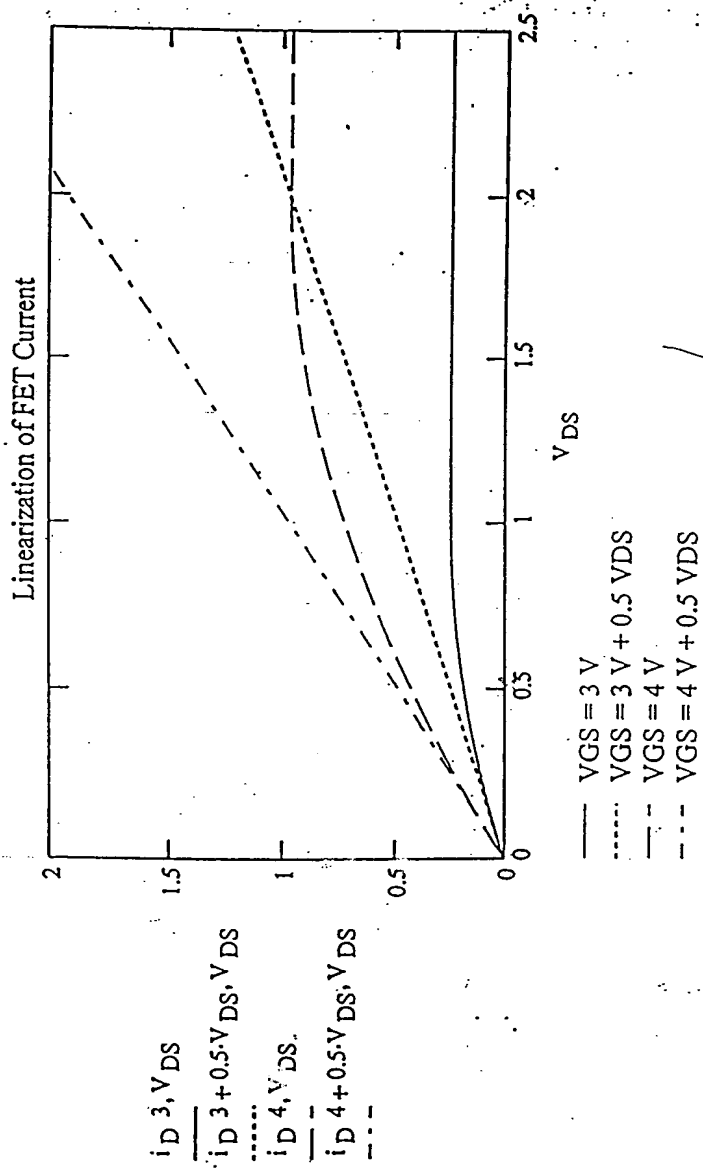


Fig. 46

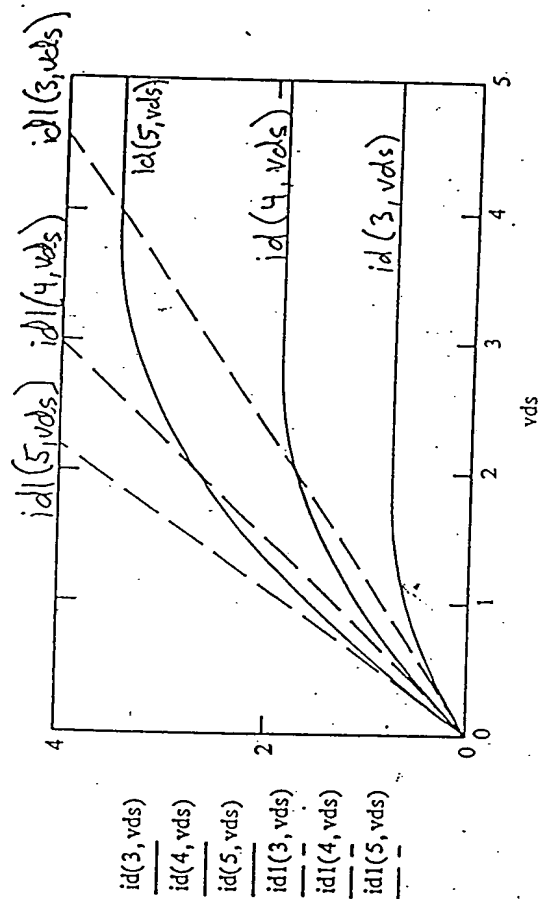
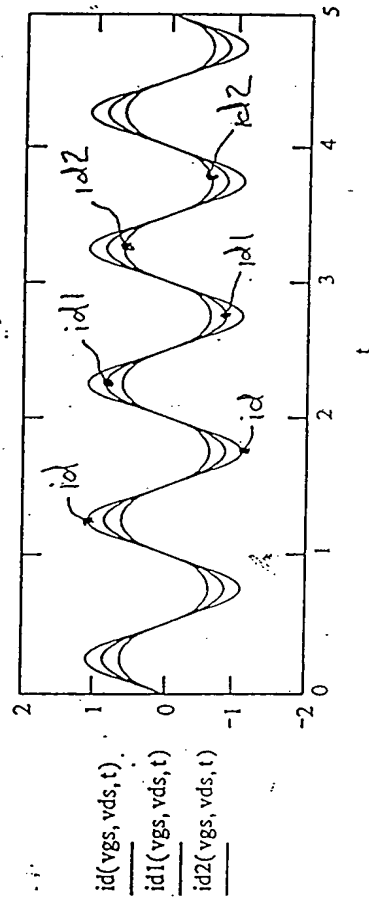


FIG. 47

0985851 051601
T09T50" T5855860



F16, 48

095583 05160
T09T50 T585360

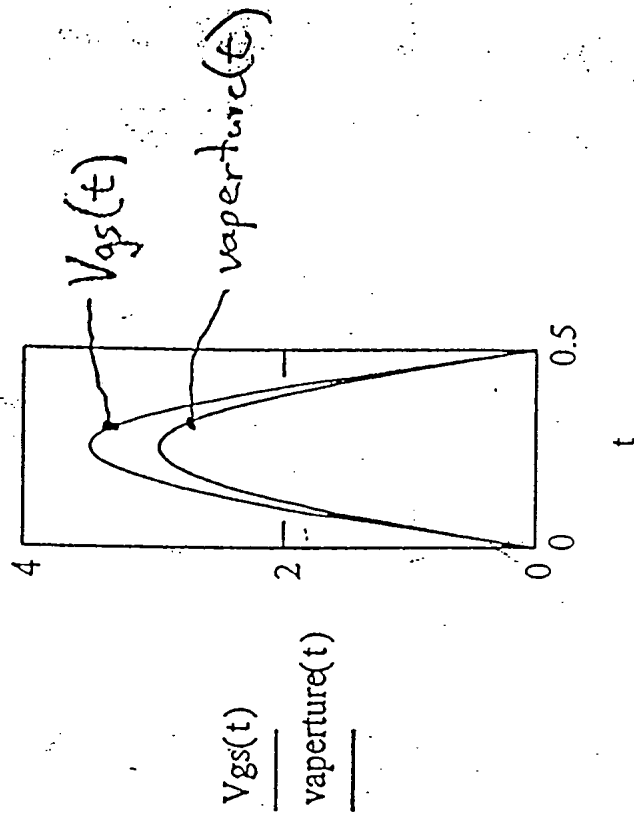


FIG. 49

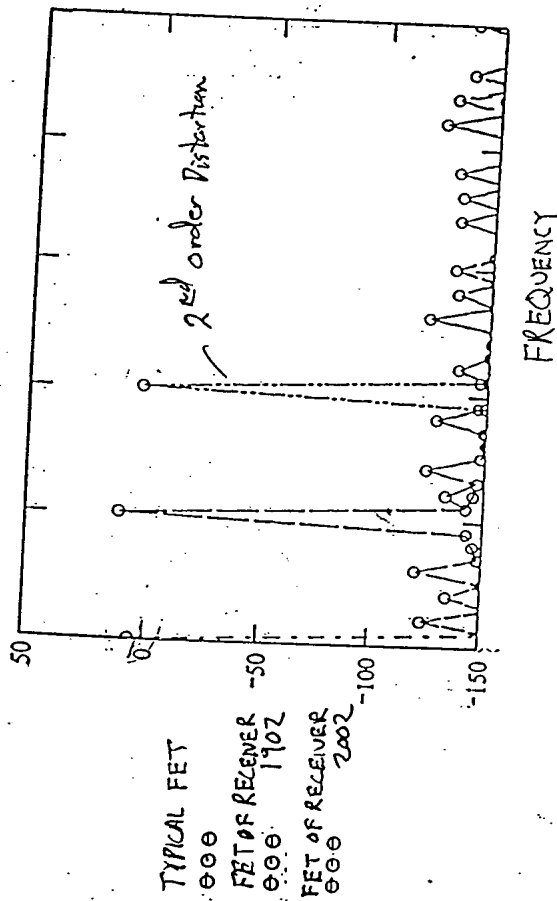


FIG. 50

FOOT 50" TSS 5860

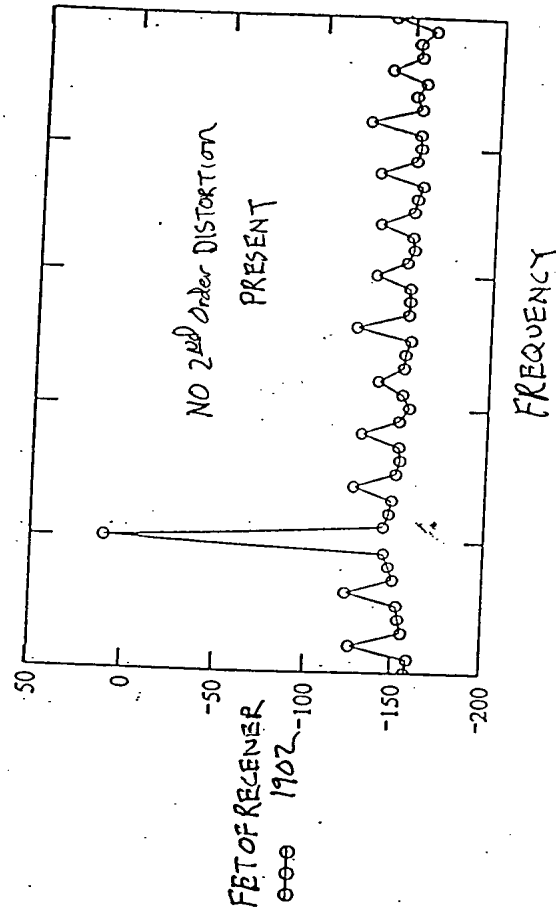


FIG. 51

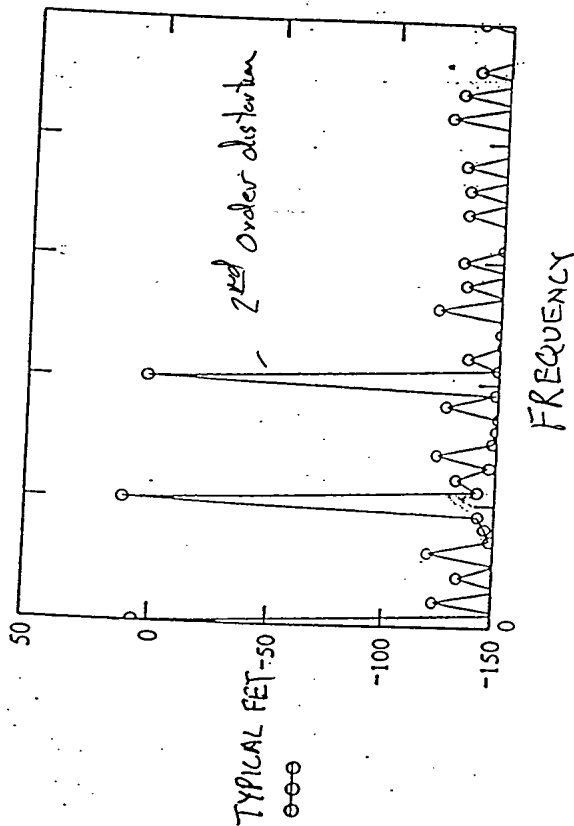


FIG. 52

095551 051601
T09T50" T585260

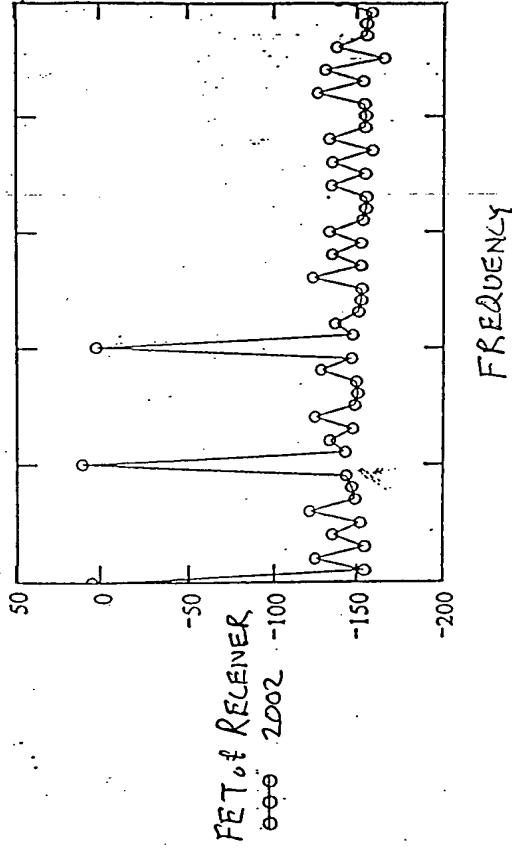


FIG. 53

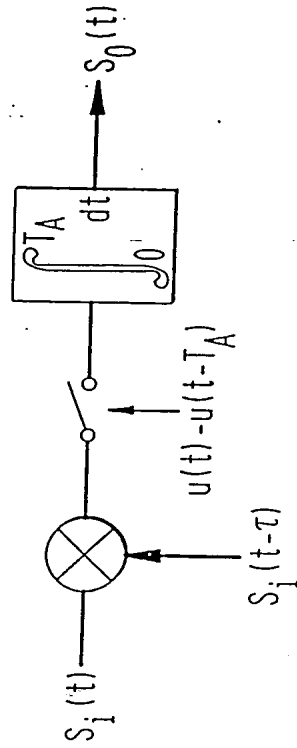


FIG. 54

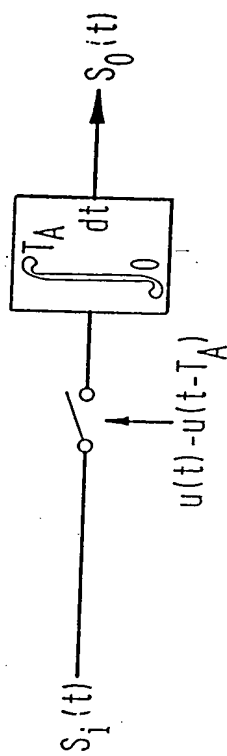


FIG. 55

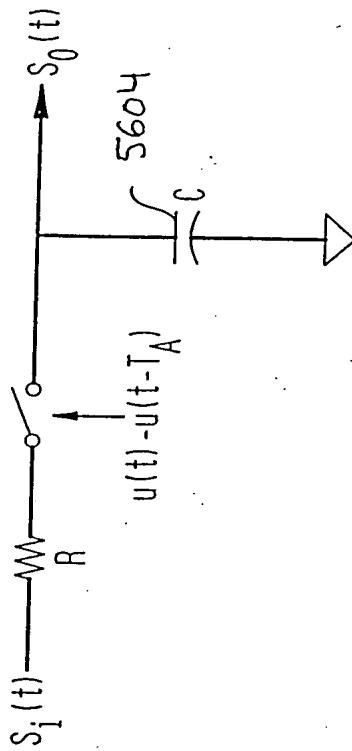


FIG. 56

UFT OUTPUT CHARGE TRANSFER

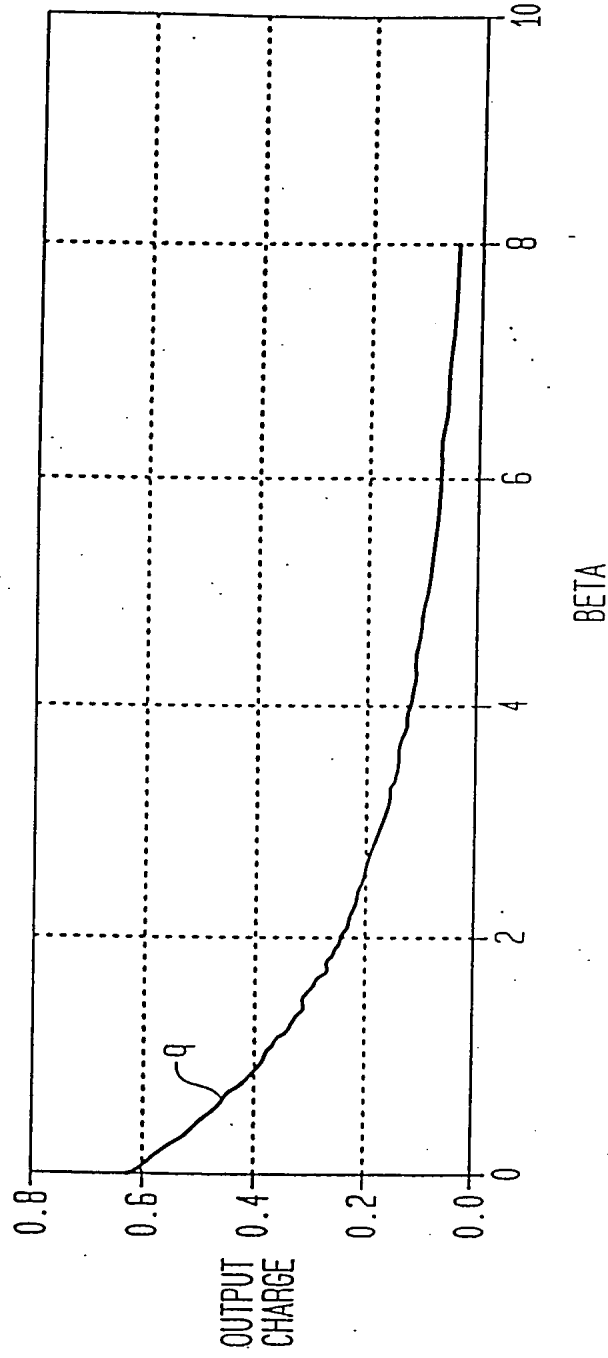


FIG. 57

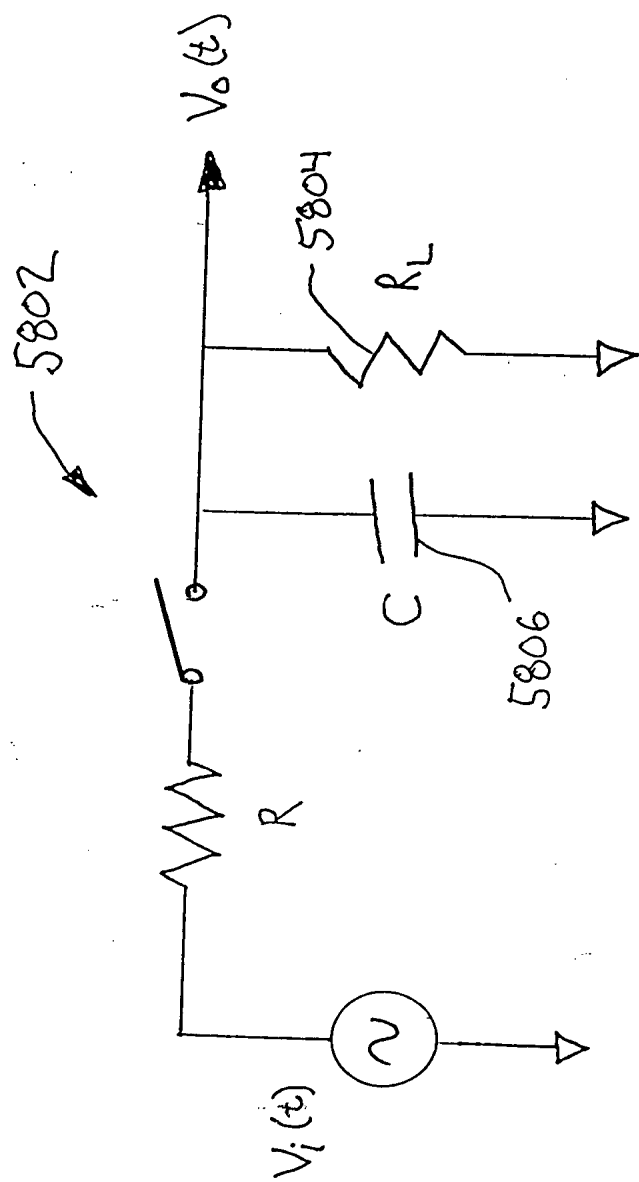


FIG. 58

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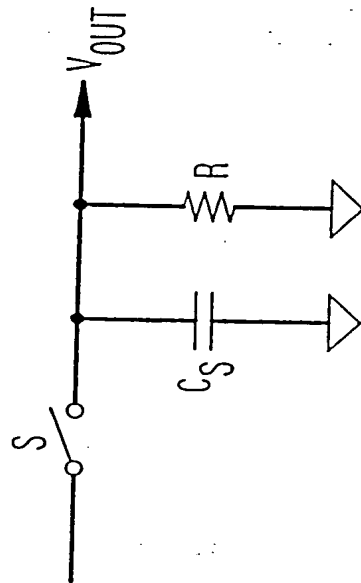


FIG. 59

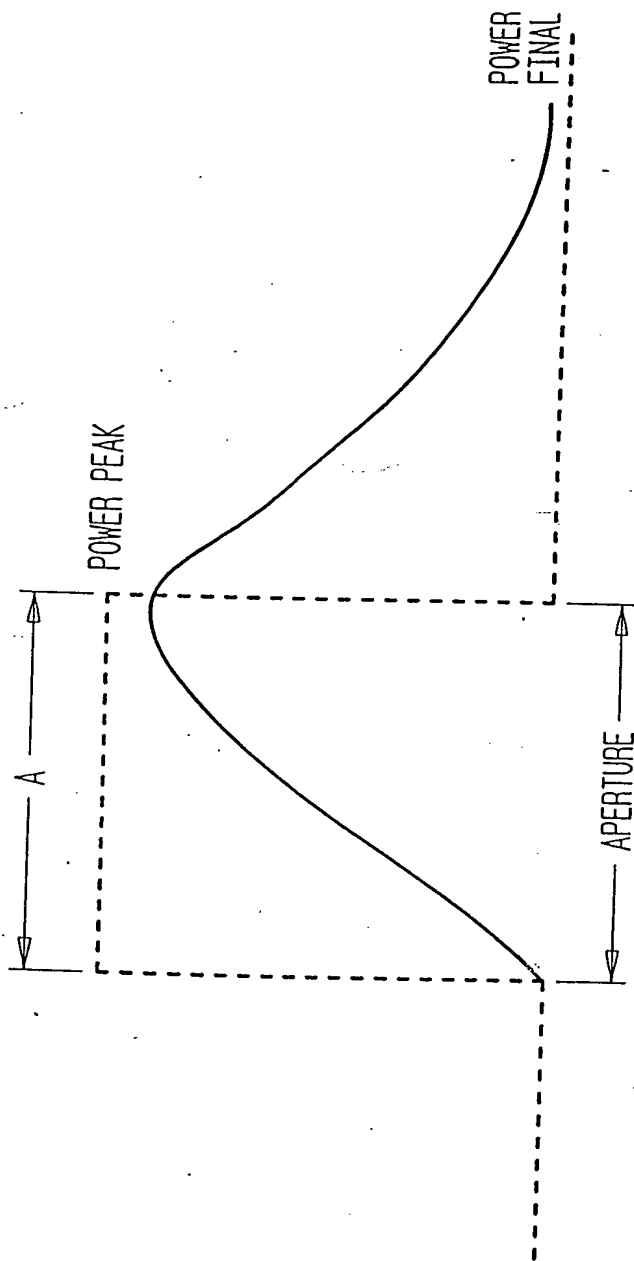


FIG. 60

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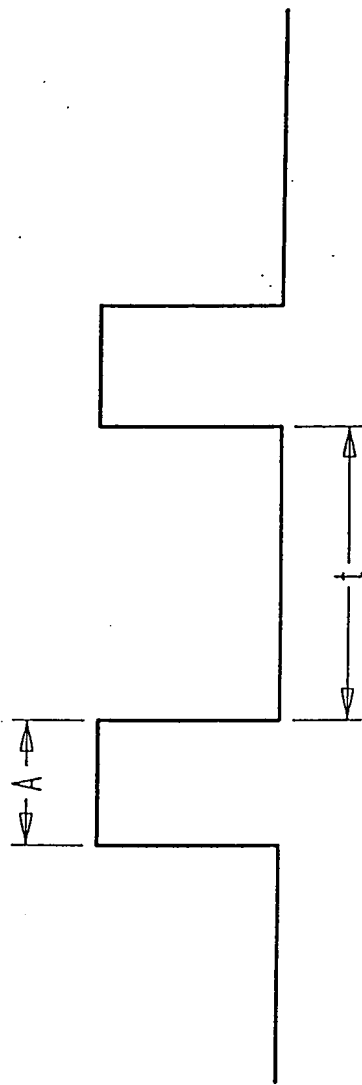


FIG. 61

METHOD FOR DOWN-CONVERTING AN ELECTROMAGNETIC
SIGNAL

6200

RECEIVE A RF INFORMATION SIGNAL

~6202

ELECTRICALLY COUPLE THE RF INFORMATION SIGNAL TO A
CAPACITOR

~6204

CONTROL A CHARGING AND DISCHARGING CYCLE OF THE
CAPACITOR WITH A SWITCHING DEVICE ELECTRICALLY
COUPLED TO THE CAPACITOR

~6206

PERFORM A PLURALITY OF CHARGING AND DISCHARGING
CYCLES OF THE CAPACITOR, THEREBY FORMING A DOWN-
CONVERTED INFORMATION SIGNAL

~6208

END

~6210

FIG. 62

09855851 051601